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JSC-17878

Flight Data File
Crew Activity Plan
STS-4

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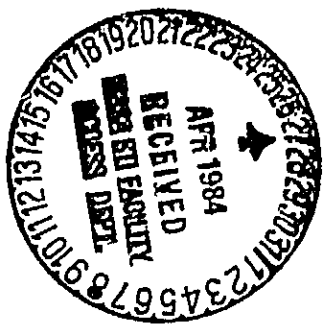
Flight Operations Directorate
Operations Division

Final
May 14, 1982



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Lyndon B. Johnson Space Center
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FLIGHT OPERATIONS DIRECTORATE

STS-4 CREW ACTIVITY PLAN

FINAL
MAY 14, 1982

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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on standard JSC Form 482 to CH4/R. D. Snyder, Bldg 4, Rm 2023, 713-483-2307.

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CHANGE CONTROL RECORD

ORBITAL FLIGHT TEST: STS-4 Crew Activity Plan

CONTROL NO.	FDF EDITION INCORPORATED*		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
	BASIC	03/13/82	
CAP(4)-1	FINAL	05/14/82	
CAP(4)-2	FINAL	05/14/82	
CAP(4)-3	FINAL	05/14/82	
CAP(4)-4A			WITHDRAWN
CAP(4)-5	FINAL	05/14/82	
CAP(4)-6	FINAL	05/14/82	
CAP(4)-7	FINAL	05/14/82	
CAP(4)-8	FINAL	05/14/82	
CAP(4)-9	FINAL	05/14/82	
CAP(4)-10	FINAL	05/14/82	
CAP(4)-11	FINAL	05/14/82	
CAP(4)-12	FINAL	05/14/82	
CAP(4)-13	FINAL	05/14/82	
CAP(4)-17	FINAL	05/14/82	

*482 changes incorporated into current edition only are identified by change bars.

STS-4 CREW ACTIVITY PLAN

LIST OF EFFECTIVE PAGES

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CONTENTS

INTRODUCTION

The STS-4 Crew Activity Plan contains the on-orbit timeline, which is a flight data file article. It does not contain the detailed crew activities that will be covered in the STS-4 Ascent, Post Insertion, Deorbit Prep, or Entry checklists.

This on-orbit timeline satisfies the objectives specified in the STS-4 Flight Requirements Document (Final).

The flight profile (trajectory data) used for this Crew Activity Plan is from Ref. 2 which is for a June 27, 1982 launch date.

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TIMELINE FORMAT SYMBOL NOMENCLATURE

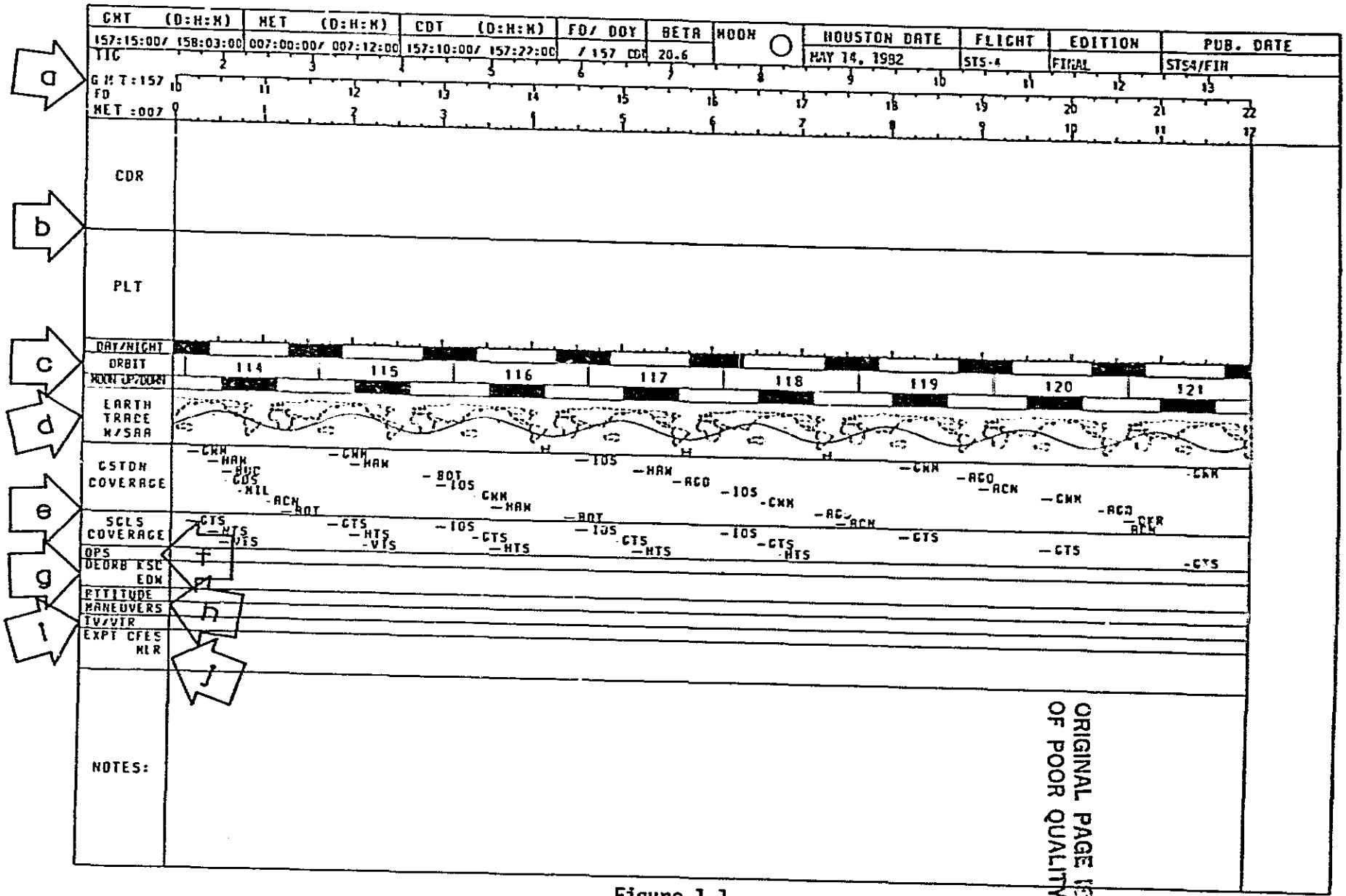

Figure 1-1

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A. FORMAT SYMBOL NOMENCLATURE

1. Summary Level Timeline (12-Hr Timespan)

The following letters (a-j) refer to those highlighted in Figure 1-1.

a. TIMESCALES - Three time references are presented in this section of the summary timeline format. The time references used are TIG Minus Time (TIG), Greenwich Mean Time (GMT), and Mission Elapsed Time (MET). MET is referenced to liftoff beginning at 00/00:00:00 (days, hours, minutes and seconds). TIG is referenced to the deorbit ignition time and counts down to 0/00:00:00 at ignition on the CRT timer. TIG is only used on the deorbit preparations on entry day.

b. CREWMEN (CDR & PLT) - This is the crewmen column of the format where titles of scheduled activities are shown for the commander (CDR) and pilot (PLT) at the appropriate times in the flight.

c. DAY/NIGHT, ORBIT, MOON UP/DOWN

1) Day/Night - The orbital day/night intervals are delineated with black bars indicating when the Orbiter is in darkness.

2) Orbit - Indicates which orbit the spacecraft is in by numerical sequence. The beginning of an orbit occurs when the Orbiter crosses the Earth's equator going from the southern to the northern hemisphere (ascending node). The succession of orbits is numbered in this column starting with Orbit 1 for launch.

3) Moon Up/Down - The moon up/down intervals are delineated with black bars indicating when the moon is down.

d. EARTH TRACE W/SAA - This is a display of the groundtrack of the Orbiter and when it passes over the South Atlantic Anomaly (SAA) (indicated by a '|——|').

e. GSTDN and SGLS COVERAGE - The GSTDN and SGLS communication coverage periods are indicated in this area with a horizontal line indicating when communication is available; the GSTDN and SGLS site is identified to the right of the line.

f. OPS - The GPC software configuration in use during the flight is indicated in this area.

g. DEORBIT KSC/EDW - Times are identified in this area when deorbit burn opportunities exist for Edwards AFB (EDW) and Kennedy Space Center (KSC).

h. ATTITUDE and MANEUVERS

1) Attitude - The current attitude of the vehicle is identified in this area, i.e., PTC, IMU, -ZLV X-POP, -XSI.

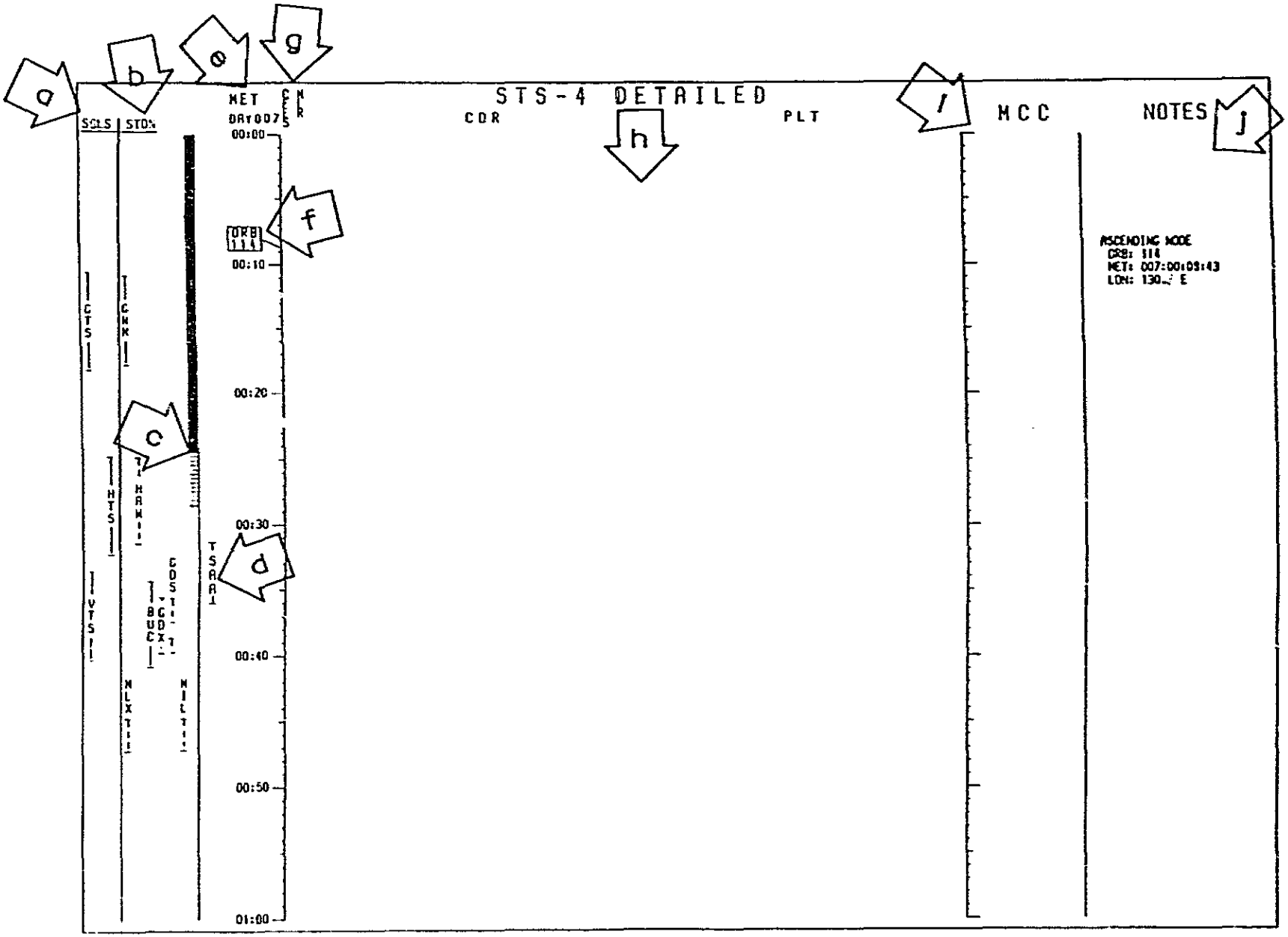

Figure 1-2

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2) Maneuvers - An '+' is placed at the time an attitude maneuver occurs if the duration in attitude is to be greater than 15 minutes.

i. TV/VTR - Live TV or recorded TV (VTR) is indicated in this area with a '|——|'.

j. CFES/MLR - Payload operating periods are indicated with a '|—xxx—|'.

2. Detailed Level Timeline (1-Hr Timespan)

The following letters (a-j) refer to those highlighted in Figure 1-2.

a. SGLS COVERAGE - In this column the SGLS sites and their acquisition periods are identified by a solid line. The sites are HTS, VTS, GTS, IOS, and NHS.

b. GSTDN COVERAGE - In this column the GSTDN sites and their acquisition periods are identified. Each site acquisition period is annotated by a solid line, a dashed line or a dotted line. The different annotations indicate the following:

A site that has S-Band, UHF voice and TV capabilities (GDS, HAW, MIL, MLX, GDX)

A site with S-Band and UHF voice capabilities (BDA, GWM, ACN, BUC, DKR, MAD, MAX)

A site with only S-Band (no UHF or TV) capabilities (AGO, ORR)

A site with only UHF (no S-band or TV) capabilities (BOT, YAR, IOS)

c. DAY/NIGHT CYCLE - In this column a solid bar indicates the period when the Orbiter and Earth are in darkness. A slashed line indicates when the Orbiter is in daylight but the Earth beneath the Orbiter is still in darkness (terminator).

d. SOUTH ATLANTIC ANOMALY (SAA) - This bar defines those periods when the Orbiter passes through the SAA.

e. MET TIMESCALE - This format is a one-hour format with minute tick marks on the vertical timescale referenced to Mission Elapsed Time (MET) with liftoff occurring at 0/00:00:00.

f. ORBIT - Indicates which orbit the spacecraft is in by numerical sequence. Orbit 1 begins at liftoff with subsequent orbits starting when the Earth's equator is crossed (ascending node).

g. ATTITUDE and PAYLOAD USER COLUMN (ATT/CFES/MLR) - Indicates Orbiter attitude and when CFES and MLR are in operation.

h. CREWMAN COLUMNS - The activities for the CDR and PLT are scheduled in this area.

i. MCC COLUMN - Any uplinks, commands or updates required are scheduled at the appropriate time in this column. A vertical line is also used to indicate TV coverage.

j. NOTES - This area will be used for location of pads, times of star availability, time and longitude of the ascending node, TV and photography scenes, and any other supplemental information required.

k. In the timescale a DAP A and DAP B CONFIG reference will be included. A number is associated with both DAPs A and B; each number indicates a particular DAP configuration for either DAP A or DAP B. The DAP reference without parentheses indicates the 'active' DAP for that time period on the page. Table 1-1 identifies the various configurations for DAP A and DAP B that are used in the STS-4 timeline.

DAP A CONFIGURATIONS

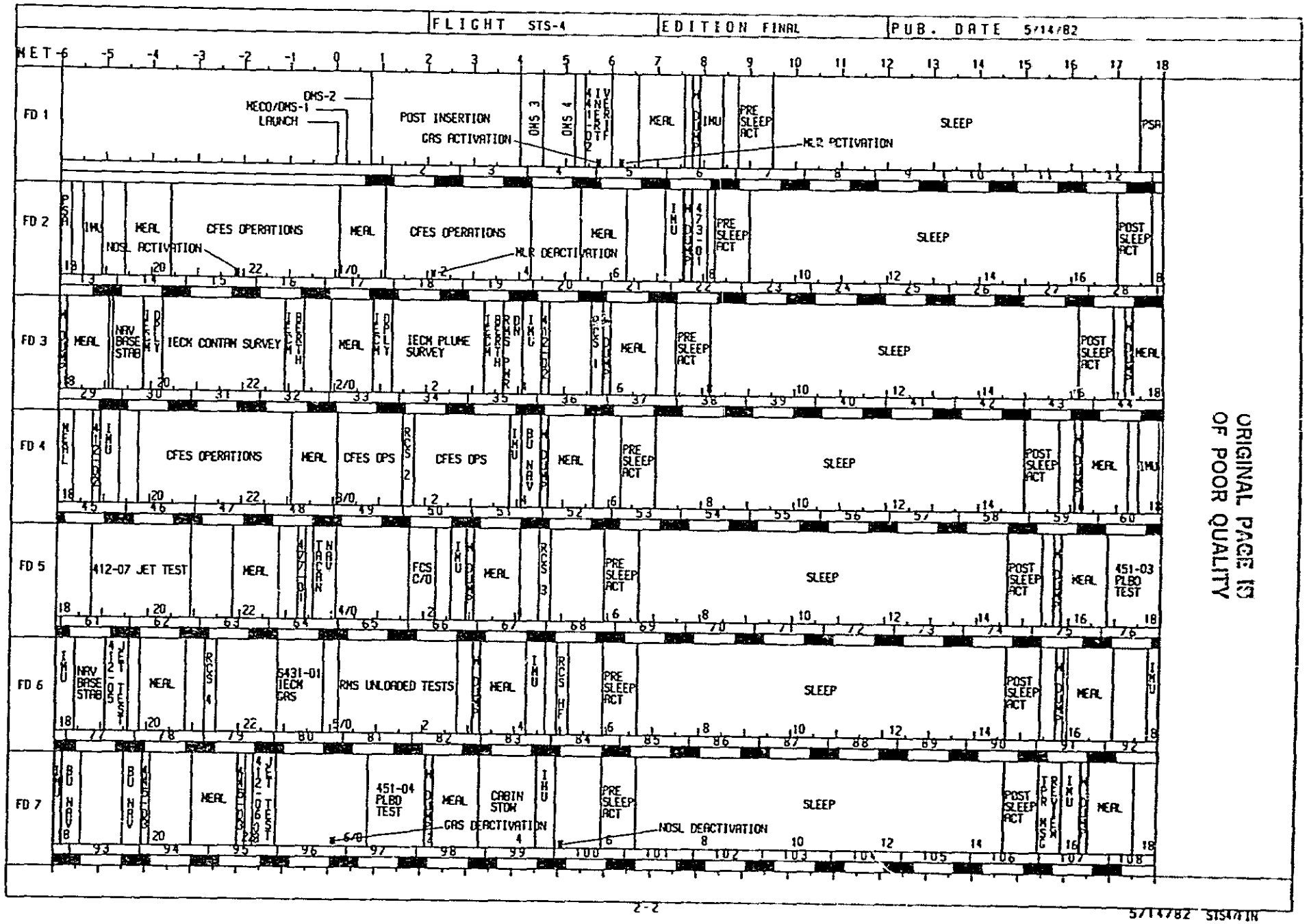
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16
TRANSLATION																	
PULSE	ft/sec	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.14	0.1	0.1	0.1	0.1	0.1
ROTATION																	
DSC RT	NORM °/sec	0.2	0.2	2.0	0.2	1.0	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	VERN °/sec	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5	0.007	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PULSE	NORM °/sec	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.28	0.6	1.0	0.1	0.3	0.1
	VERN °/sec	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
COMP	NORM °/sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VERN °/sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DEADBAND																	
ATT	NORM°	5.0	5.0	1.0	5.0	5.0	3.0	3.0	5.0	5.0	1.0	5.0	5.0	5.0	5.0	5.0	0.1
	VERN°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	3.0	1.0	5.0	0.07	1.0	1.0
RATE	NORM °/sec	0.2	0.2	0.02	0.2	0.2	0.2	0.2	0.2	0.02	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	VERN °/sec	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02
JET OPT																	
P		1	1	3	3	3	3	3	1	1	1	2	3	1	1	3	1
Y		1	1	3	3	1	3	3	1	1	3	1	3	1	1	3	1
CNTL ACCEL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DAP B CONFIGURATIONS

		B1	B2	B3	B4	B5	B6
TRANSLATION							
PULSE	ft/sec	0.02	0.02	0.02	0.02	0.02	0.1
ROTATION							
DSC RT	NORM °/sec	0.5	0.5	0.5	0.2	0.5	0.5
	VERN °/sec	0.2	0.2	0.2	0.2	0.2	0.3
PULSE	NORM °/sec	0.04	0.04	0.04	0.04	0.28	0.04
	VERN °/sec	0.002	0.002	0.002	0.002	0.002	0.001
COMP	NORM °/sec	0.0	0.0	0.0	0.0	0.0	0.0
	VERN °/sec	0.0	0.0	0.003	0.0	0.0	0.0
DEADBAND							
ATT	NORM°	3.0	3.0	3.0	3.0	3.0	3.0
	VERN°	1.0	0.1	1.0	1.0	1.0	3.0
RATE	NORM °/sec	0.2	0.2	0.2	0.2	0.2	0.2
	VERN °/sec	0.02	0.02	0.02	0.02	0.02	0.02
JET OPT							
P		1	1	1	3	3	1
Y		1	1	1	3	1	1
CNTL ACCEL		0	0	0	0	0	0

STS-4 OVERVIEW

OVERVIEW



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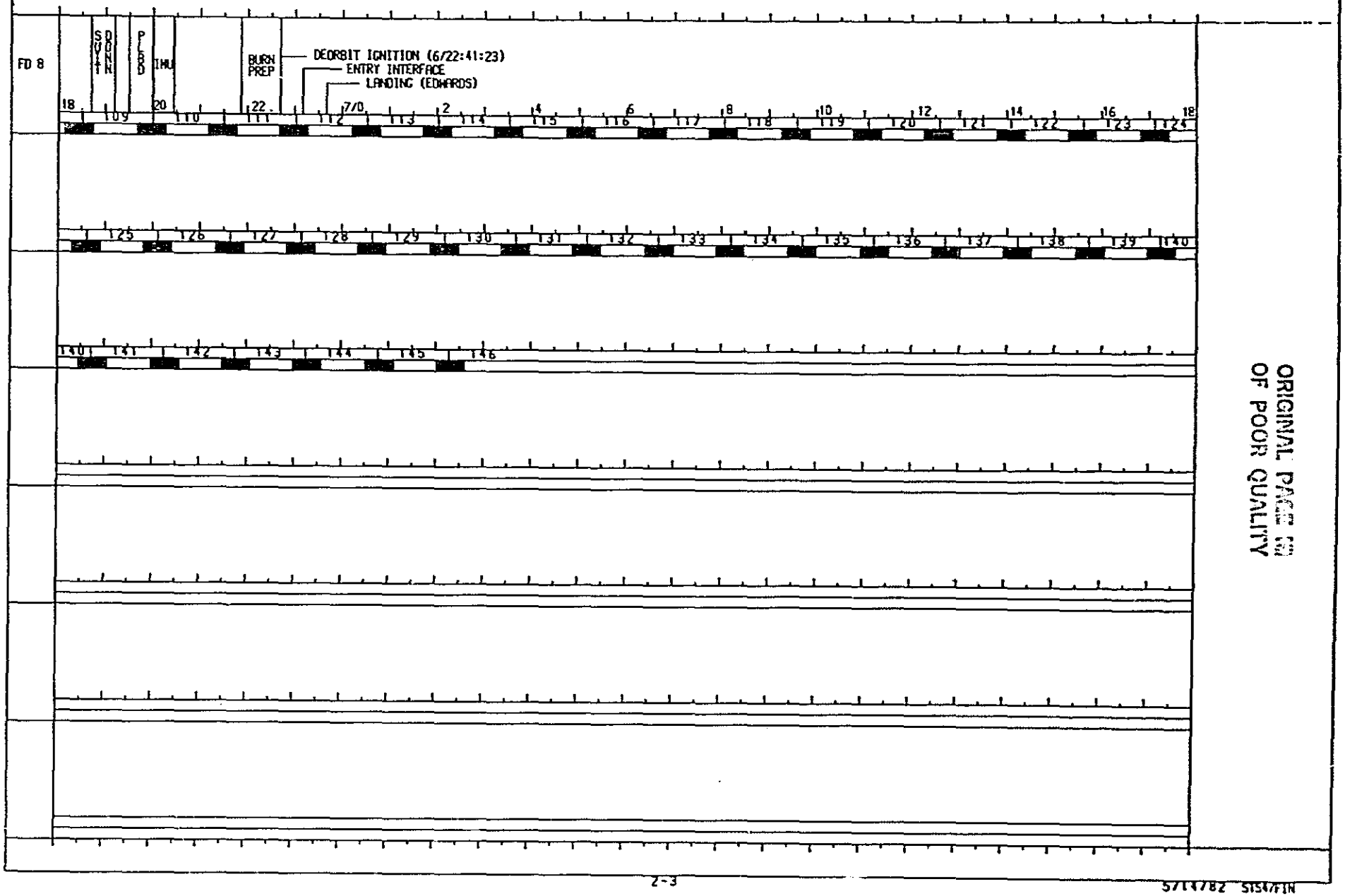

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SUMMARY TIMELINE

SUMMARY TIMELINE

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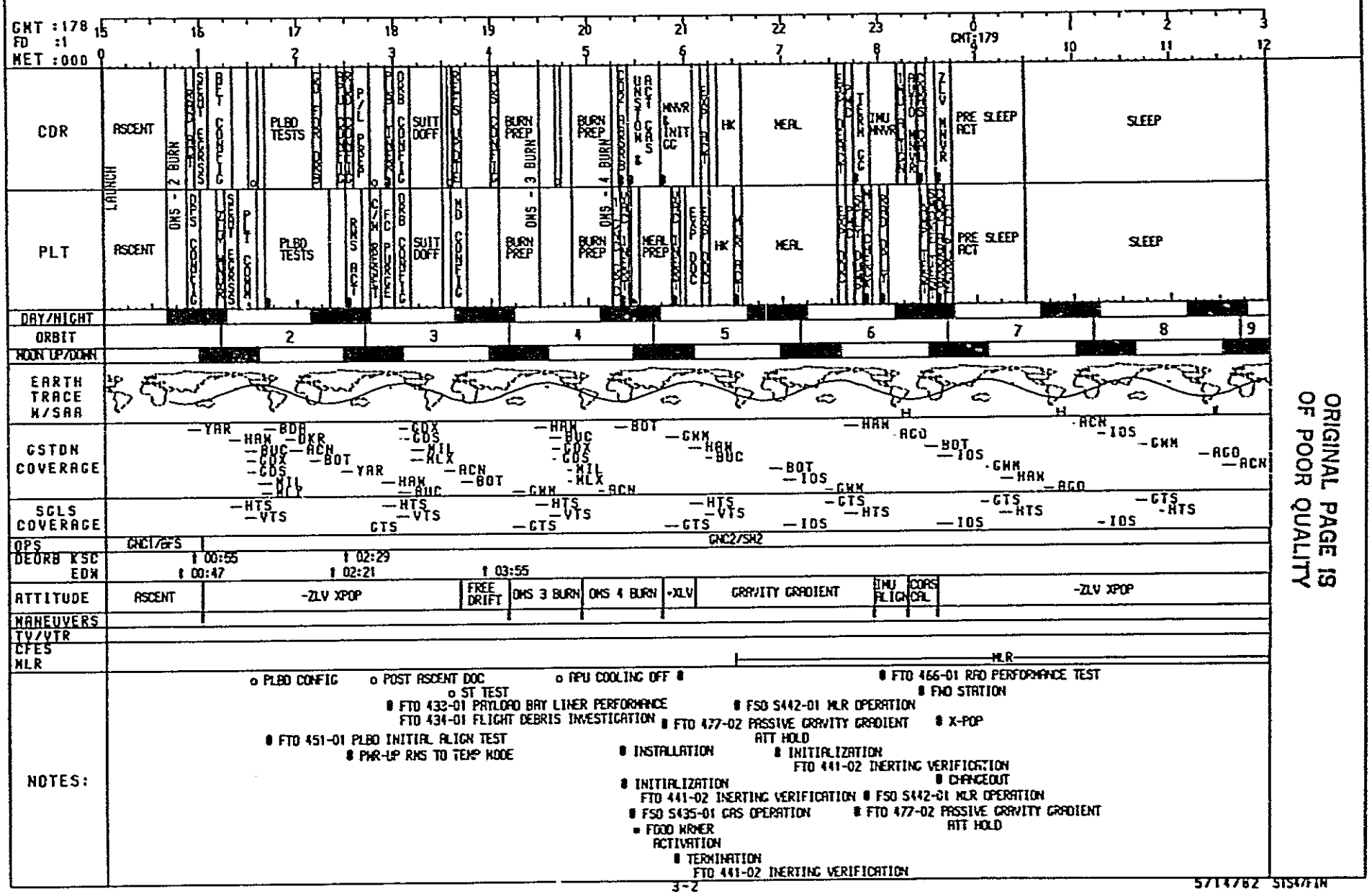

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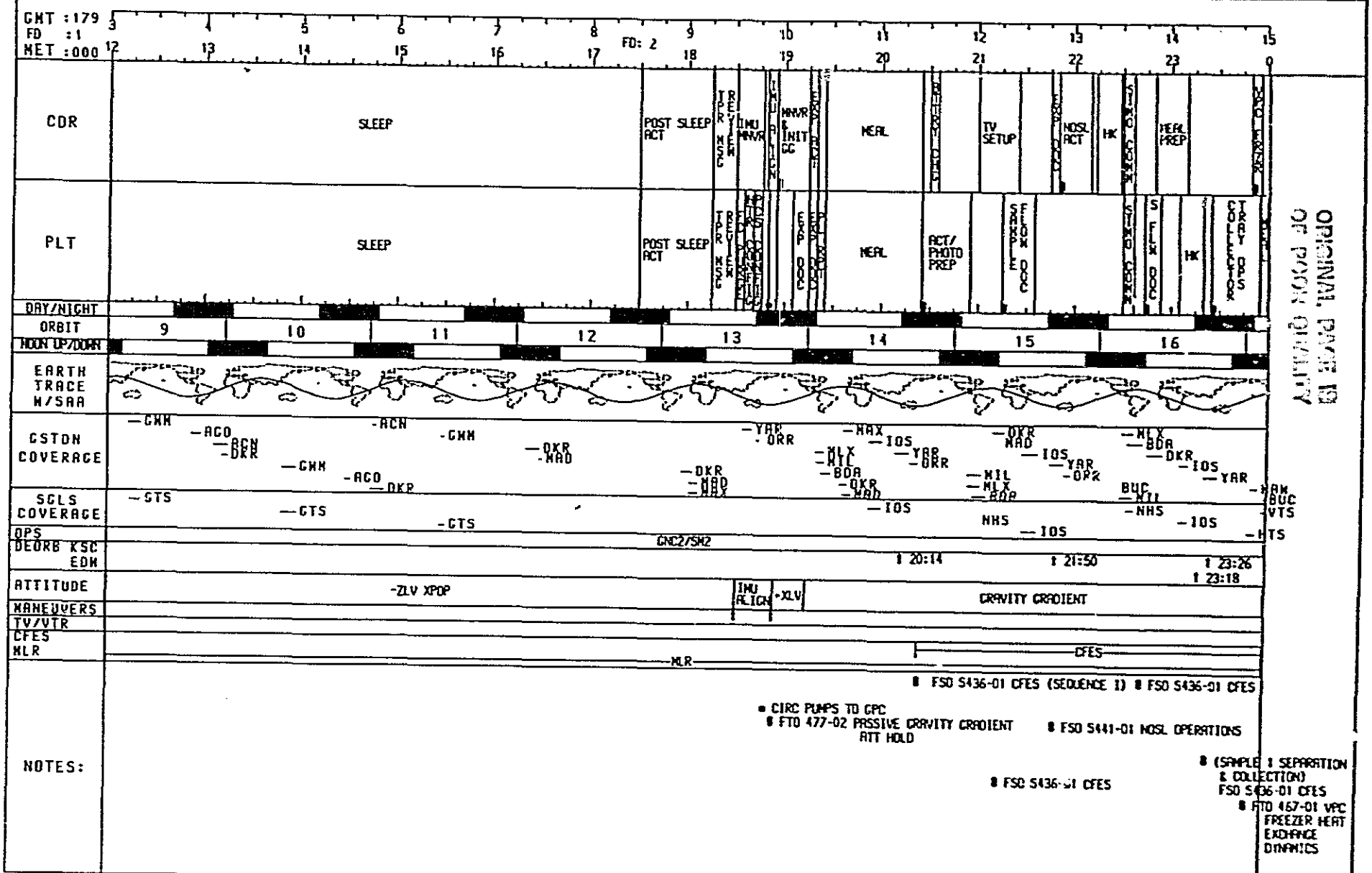

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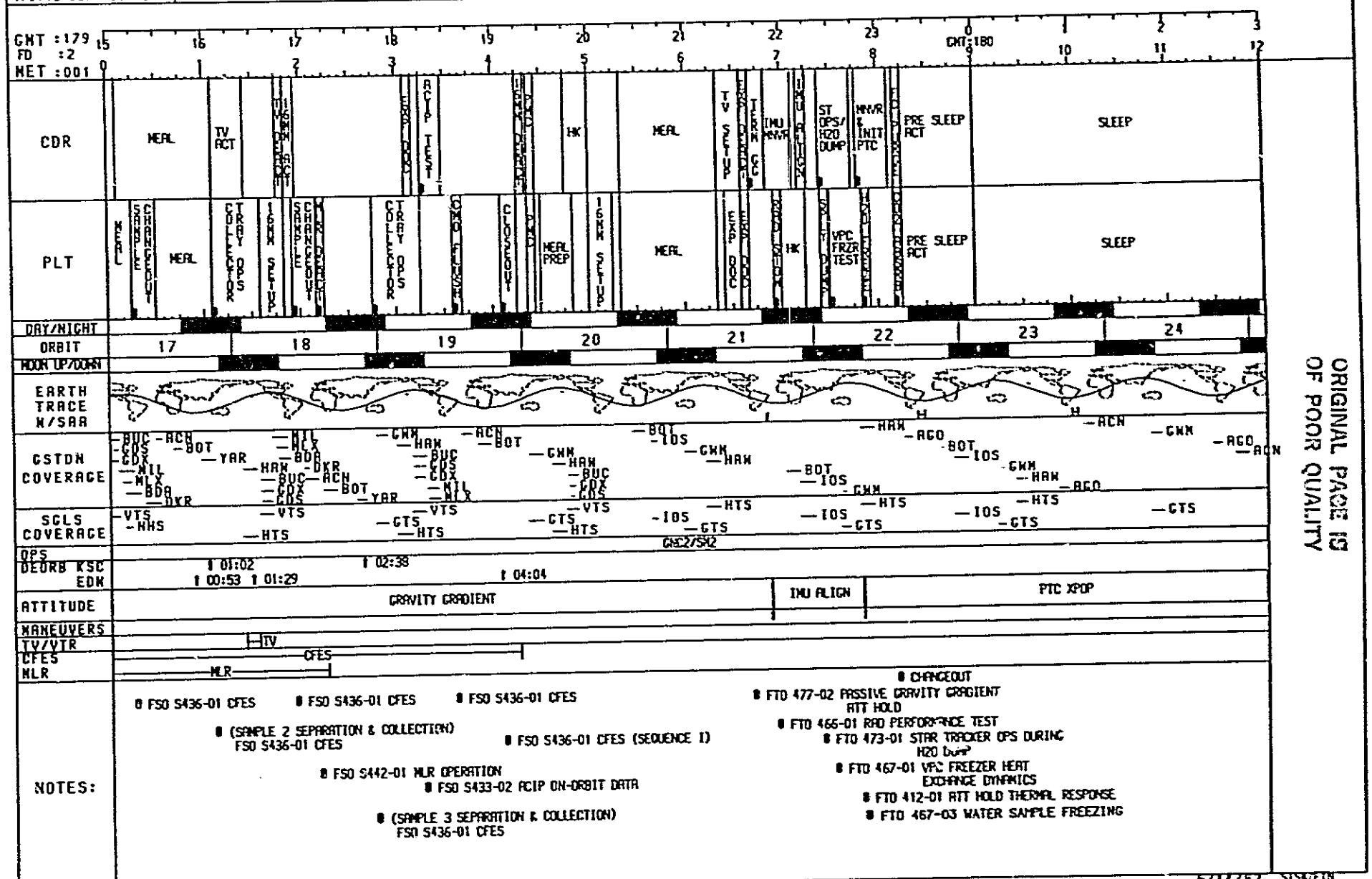

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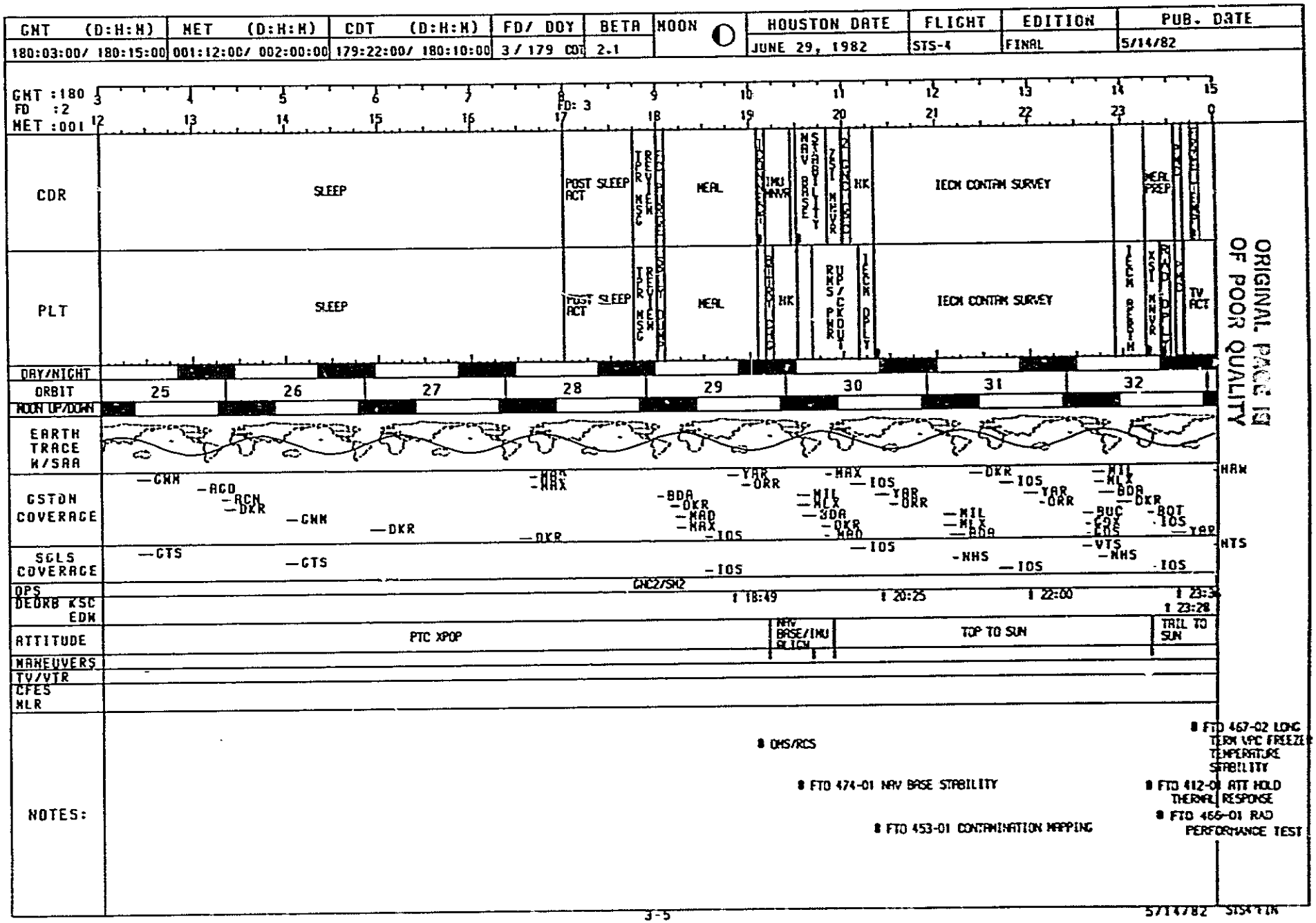

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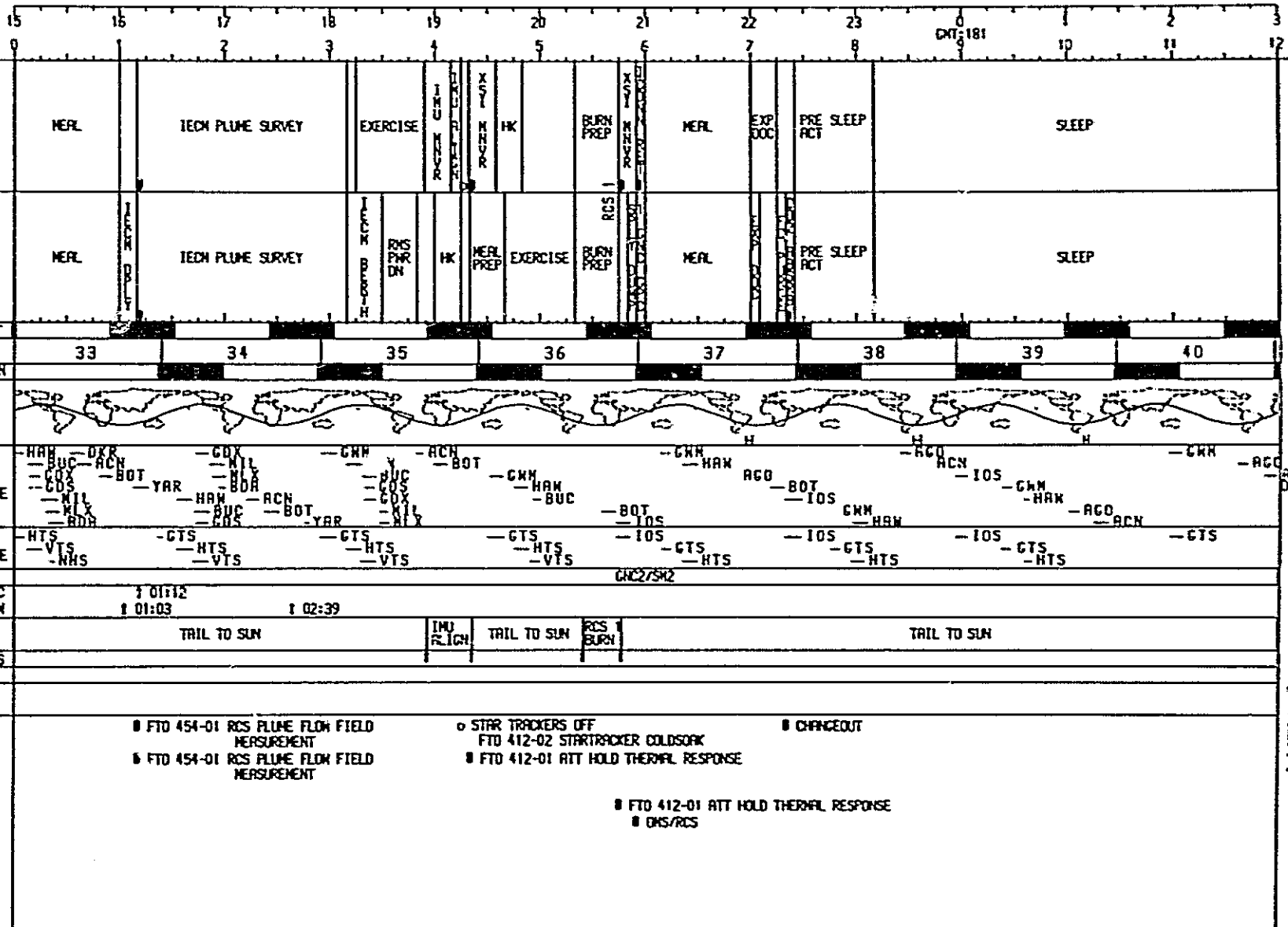

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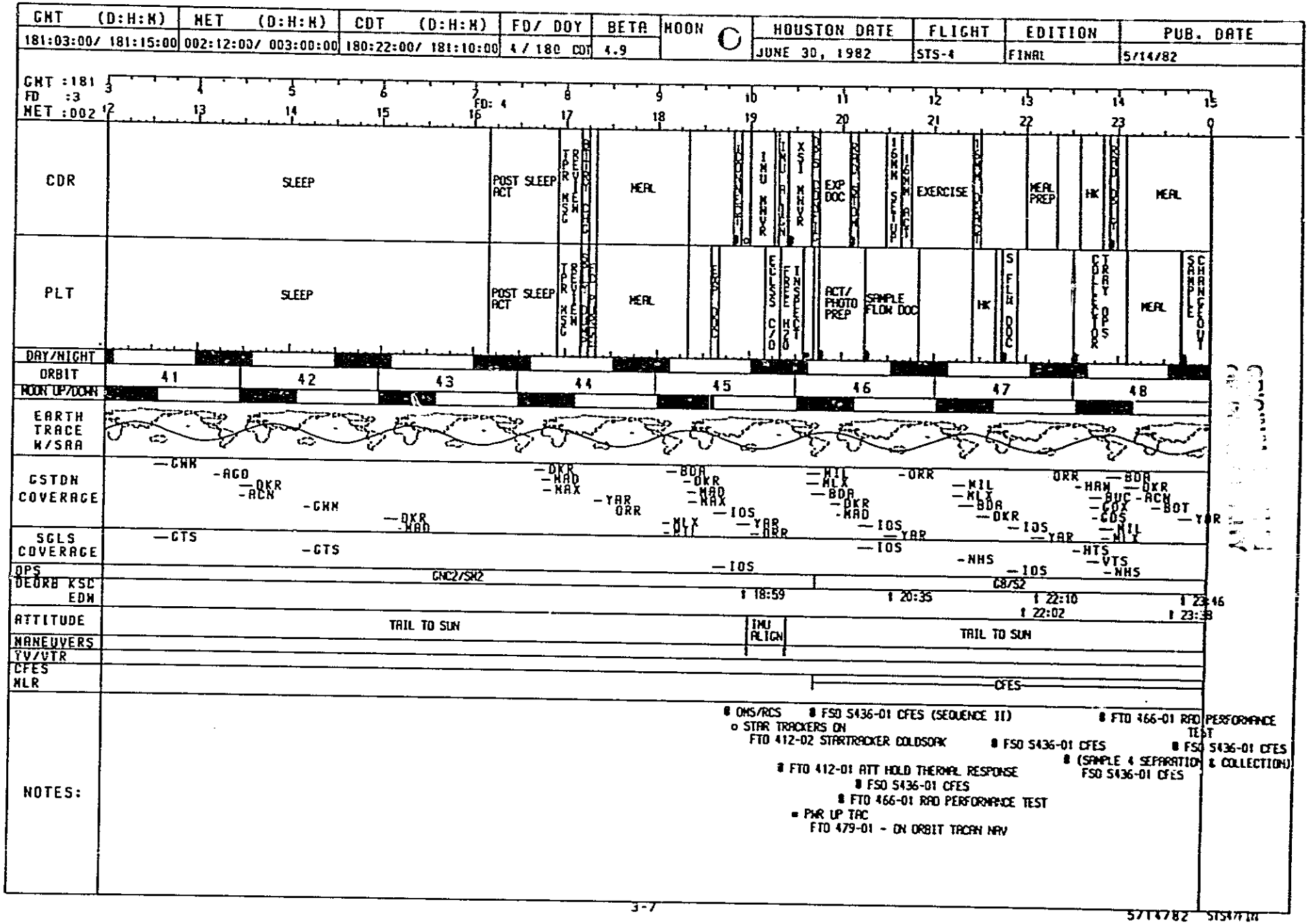

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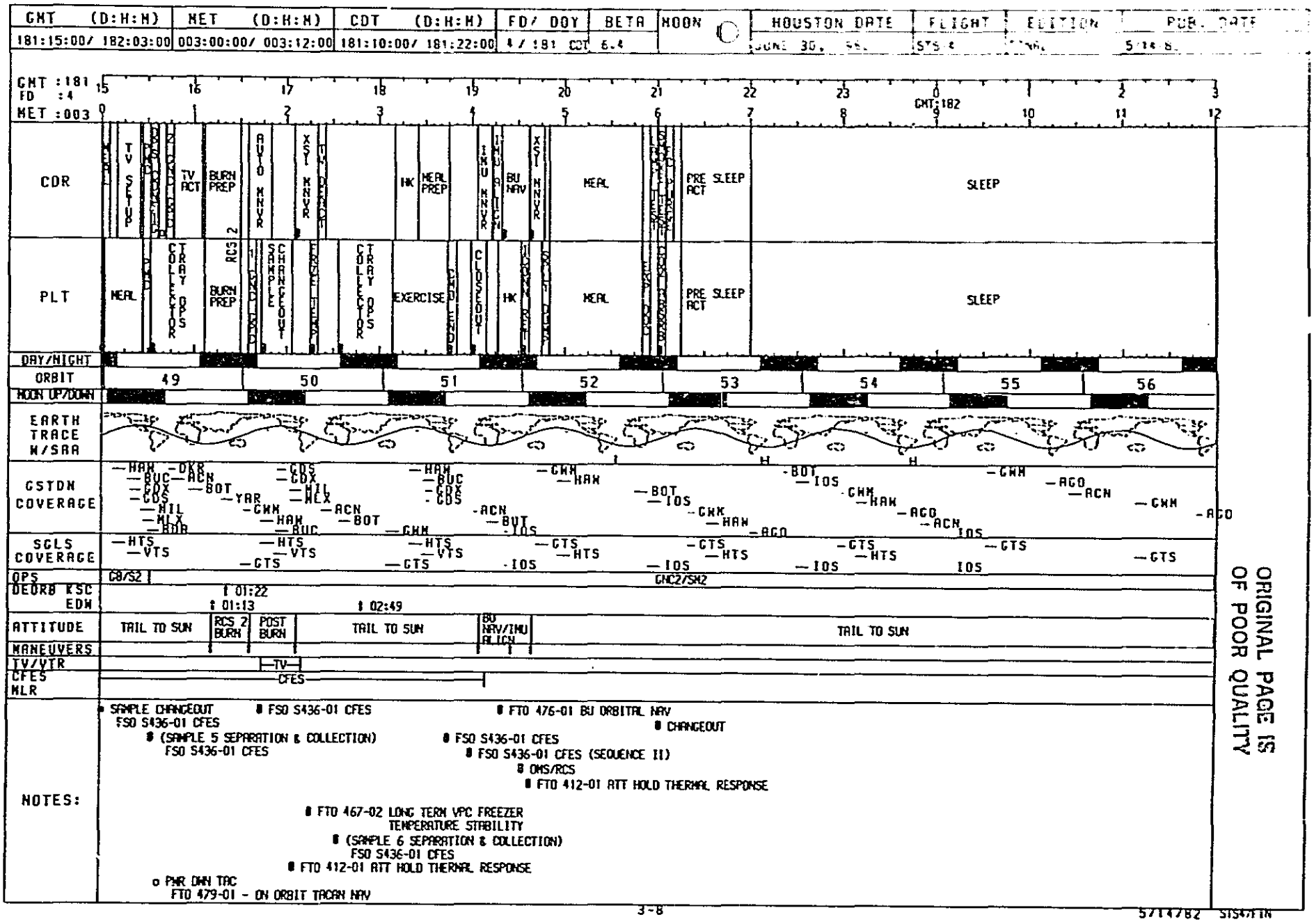
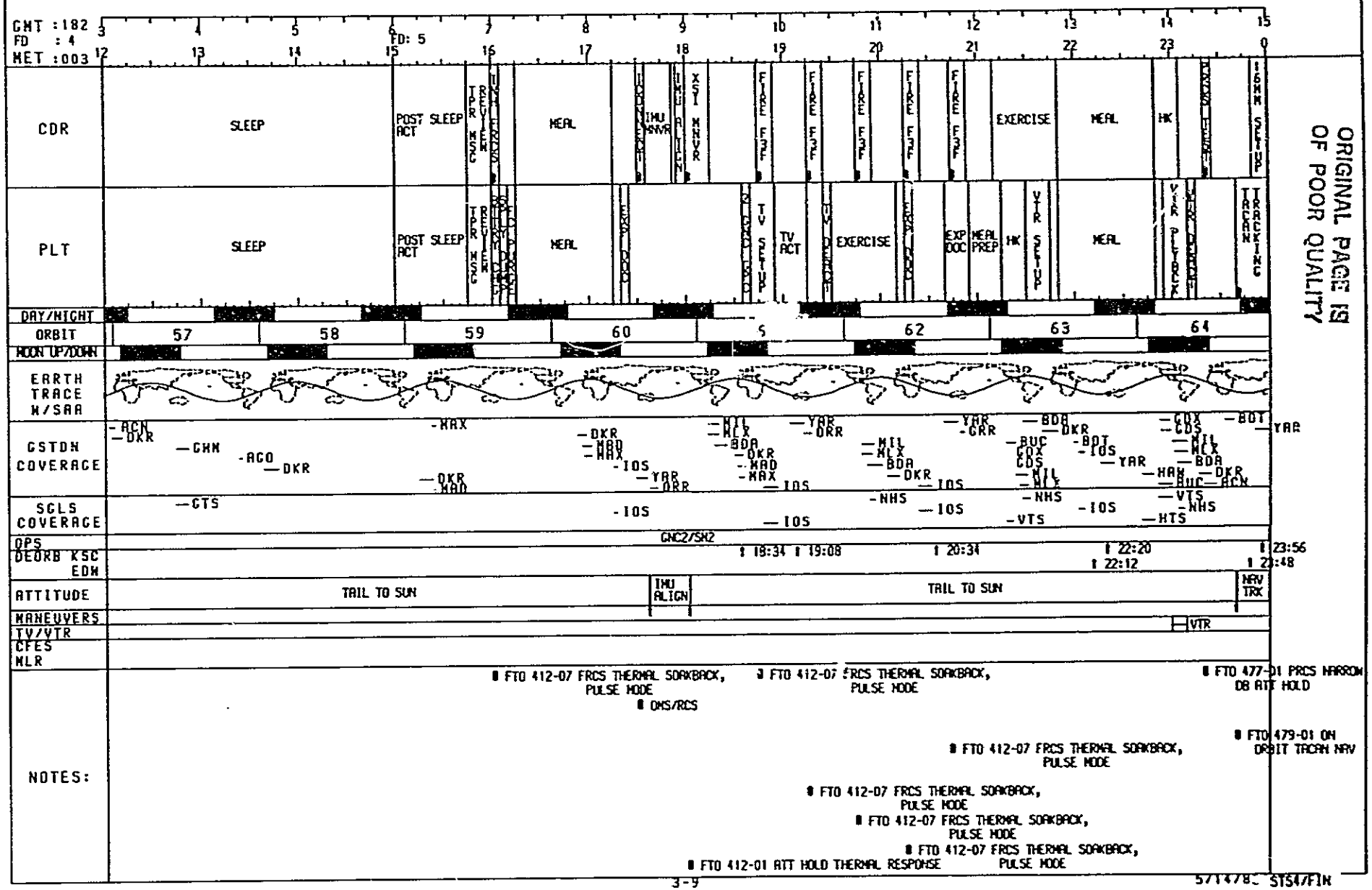
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
181:15:00/ 182:03:00	003:00:00/ 003:12:00	181:10:00/ 181:22:00	4 / 181 CDT	6.4		JUNE 30, 88	STS 8	FINAL	5/14/8



ORIGINAL PAGE IS OF POOR QUALITY

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
182:03:00/ 182:15:00	003:12:00/ 004:00:00	181:22:00/ 182:10:00	5 / 181 CDT	8.0	O	JULY 1, 1982	STS-4	FINAL	5/14/82



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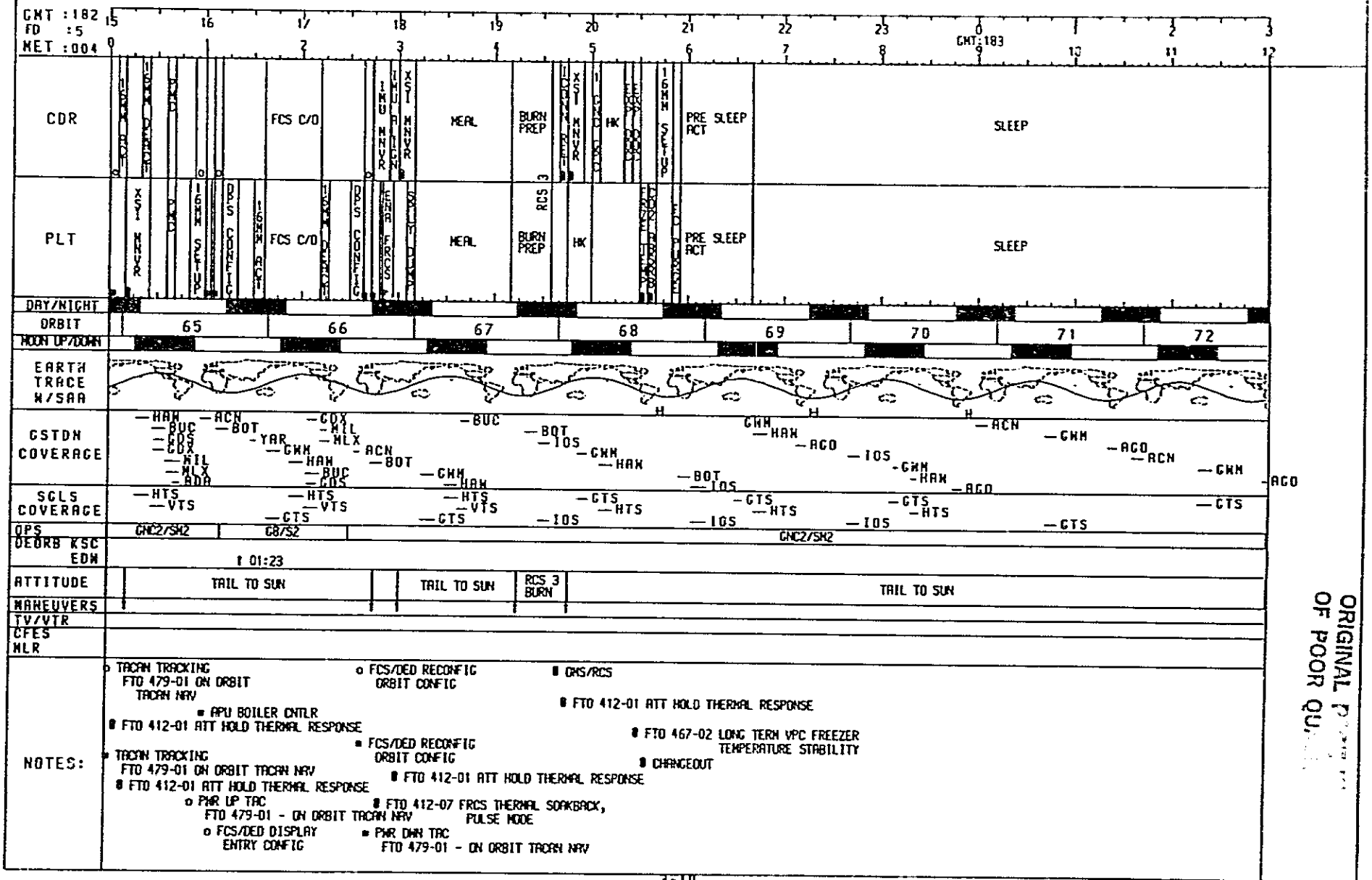
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
182:15:00/ 183:03:00	004:00:00/ 004:12:00	182:10:00/ 182:22:00	5/ 182 CDT	9.7		JULY 1, 1982	STS-4	FINAL	5/14 82



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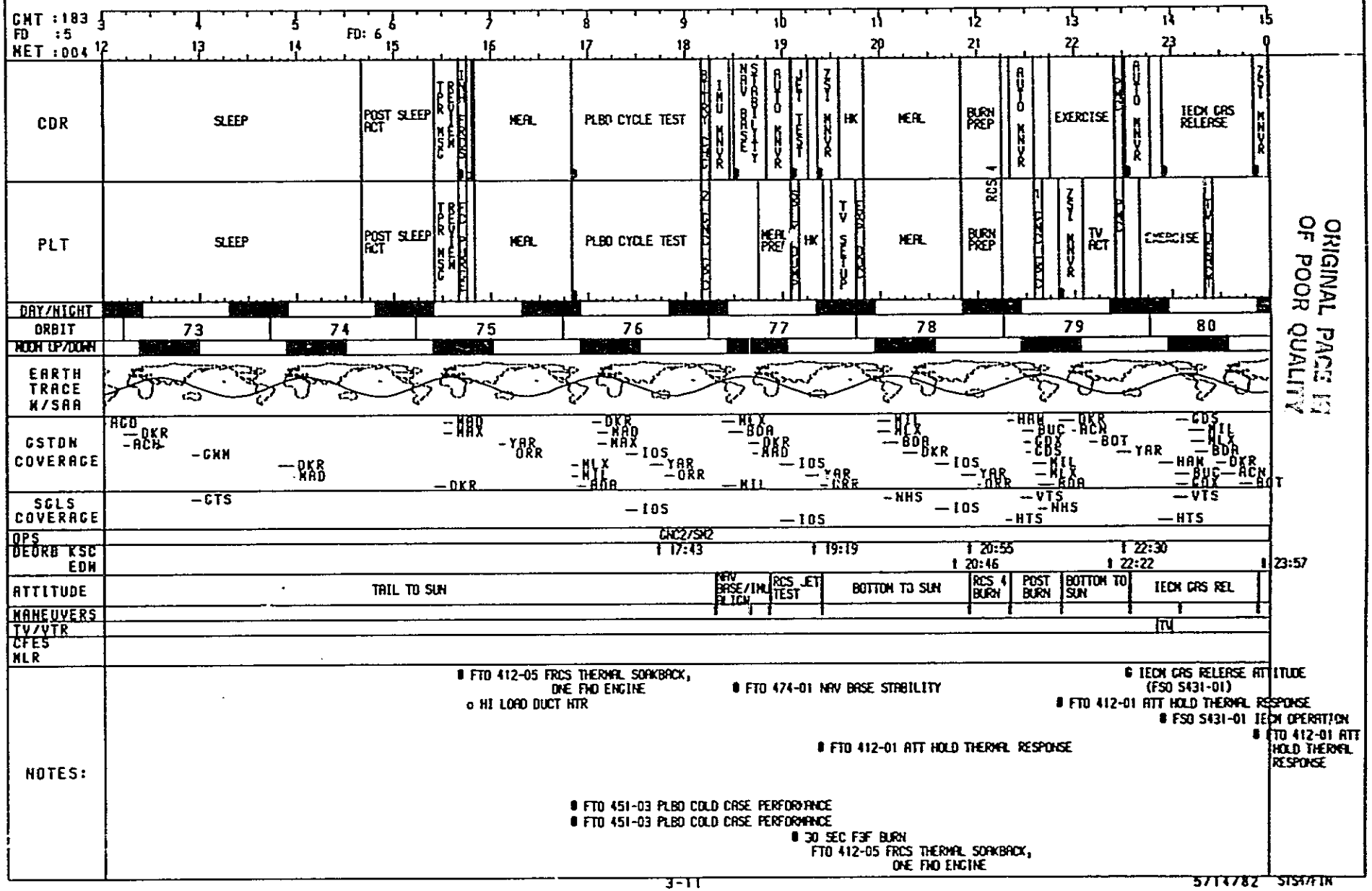
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
183:03:00/ 183:15:00	004:12:00/ 005:00:00	182:22:00/ 193:10:00	6 / 182 CDT	11.4	○	JULY 2, 1982	STS-4	FINAL	5/14/82



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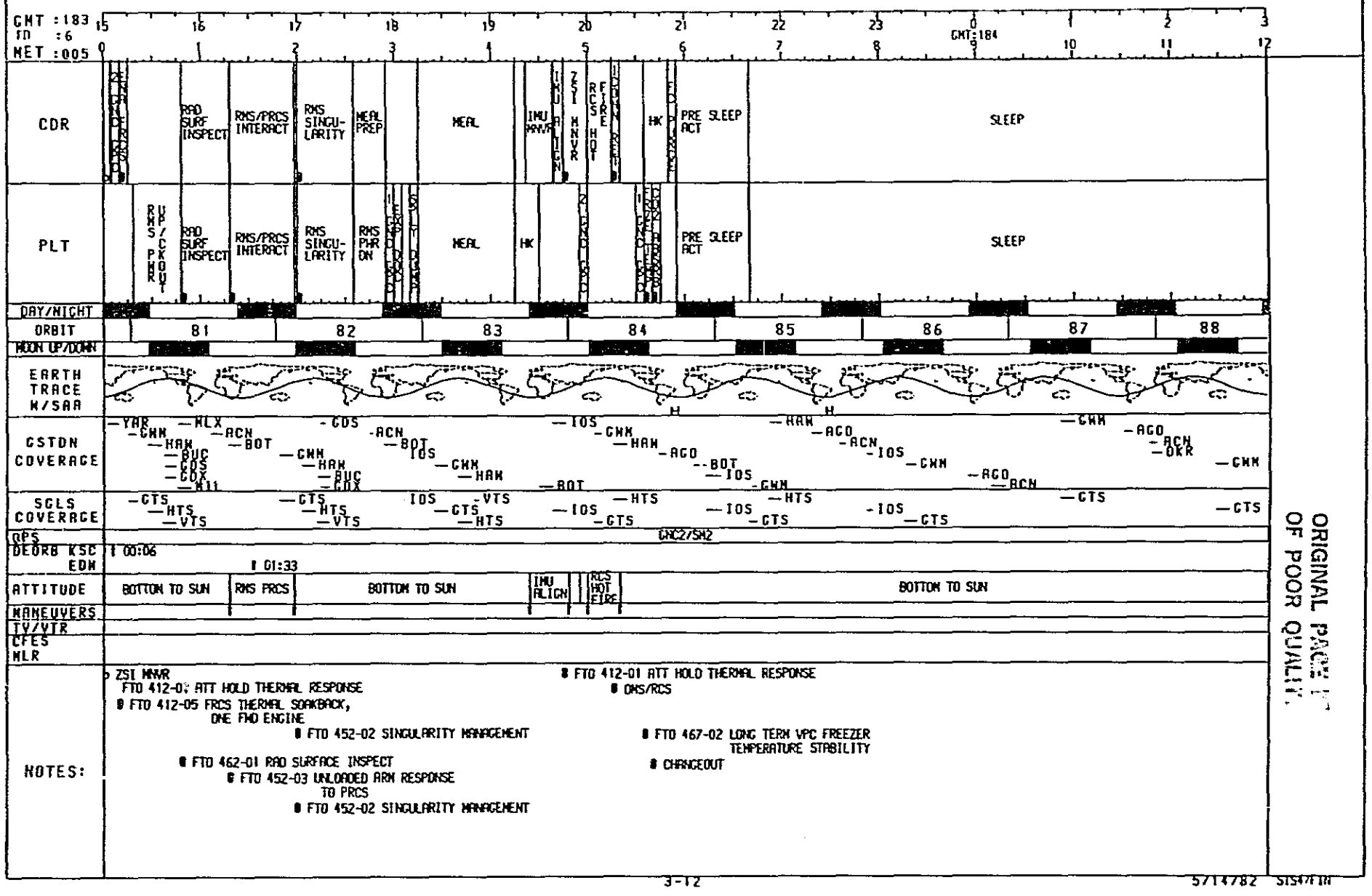
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
183:15:00/ 184:03:00	005:00:00/ 005:12:00	183:10:00/ 183:22:00	6/ 183 CDT	13.2	○	JULY 2, 1982	STS-4	FINAL	5/14/82



NOTES:

- ZSI MNVR
  FTO 412-01 ATT HOLD THERMAL RESPONSE
- FTO 412-05 FRCS THERMAL SOAKBACK, ONE FWD ENGINE
- FTO 452-02 SINGULARITY MANAGEMENT
- FTO 462-01 RAD SURFACE INSPECT
- FTO 452-03 UNLOADED ARM RESPONSE TO PRCS
- FTO 452-02 SINGULARITY MANAGEMENT
- FTO 412-01 ATT HOLD THERMAL RESPONSE
- OMS/RCS
- FTO 467-02 LONG TERM VPC FREEZER TEMPERATURE STABILITY
- CHANGEOUT

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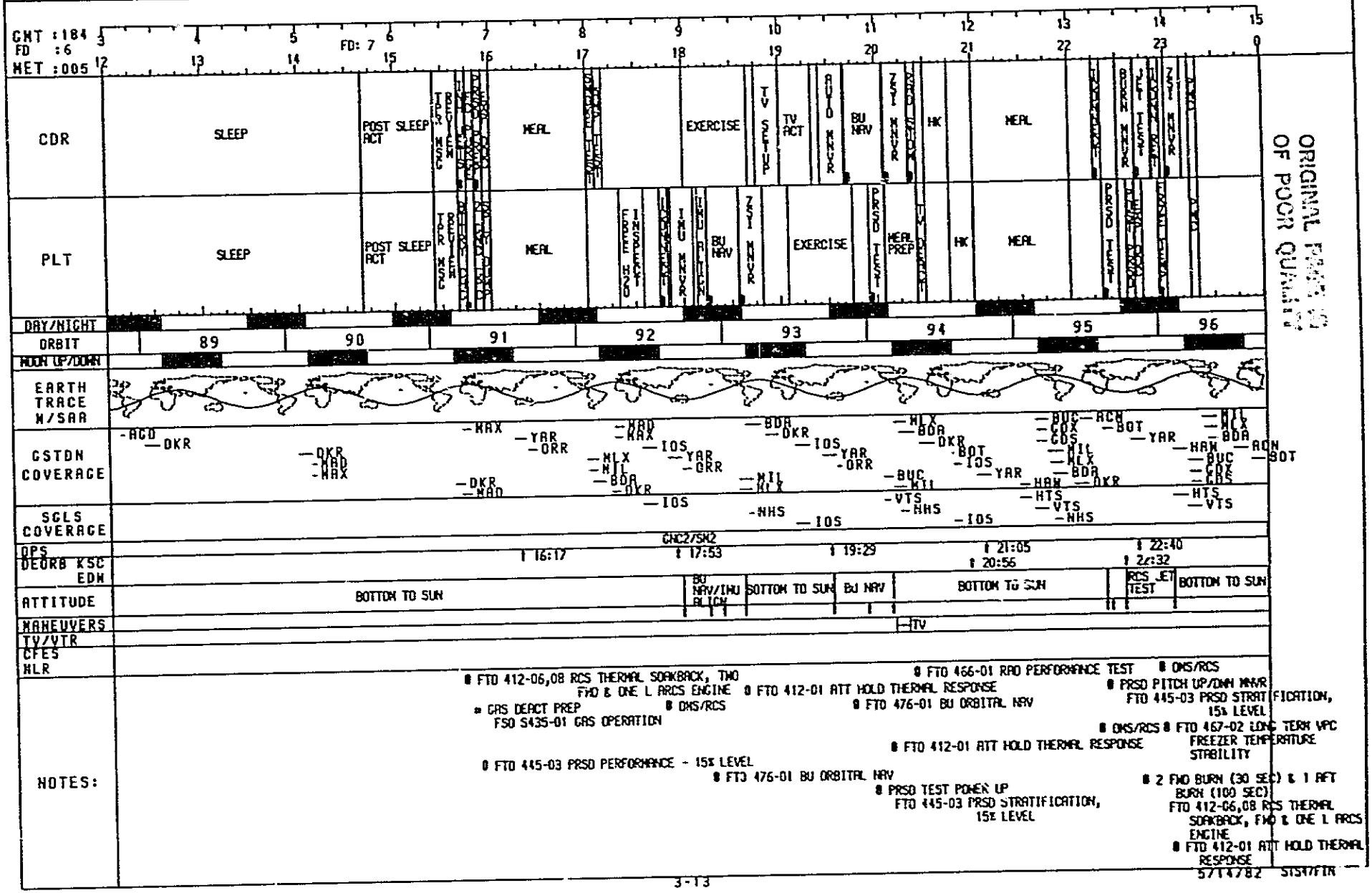
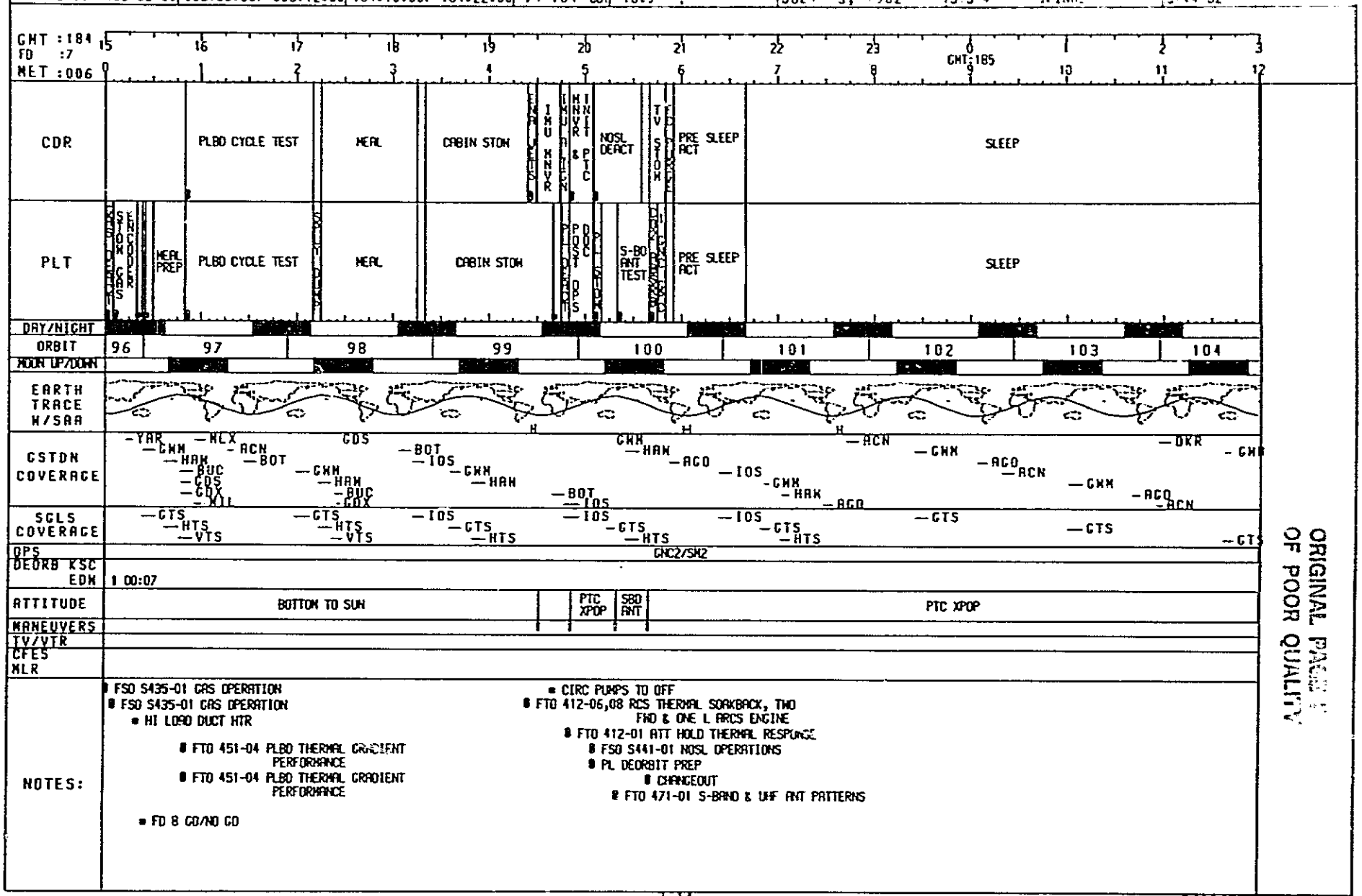
5/14/82 STS4/FIN

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
194:03:00/ 184:15:00	005:12:00/ 006:00:00	183:22:00/ 184:10:00	7 / 183 GMT	15.0		JULY 3, 1982	STS-4	FINAL	5/14/82



5/14/82 STS4/FTN

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
184:15:00/ 185:03:00	006:00:00/ 006:12:00	184:10:00/ 184:22:00	7/ 184 CDT	16.9		JULY 3, 1982	STS-4	FINAL	5/14/82



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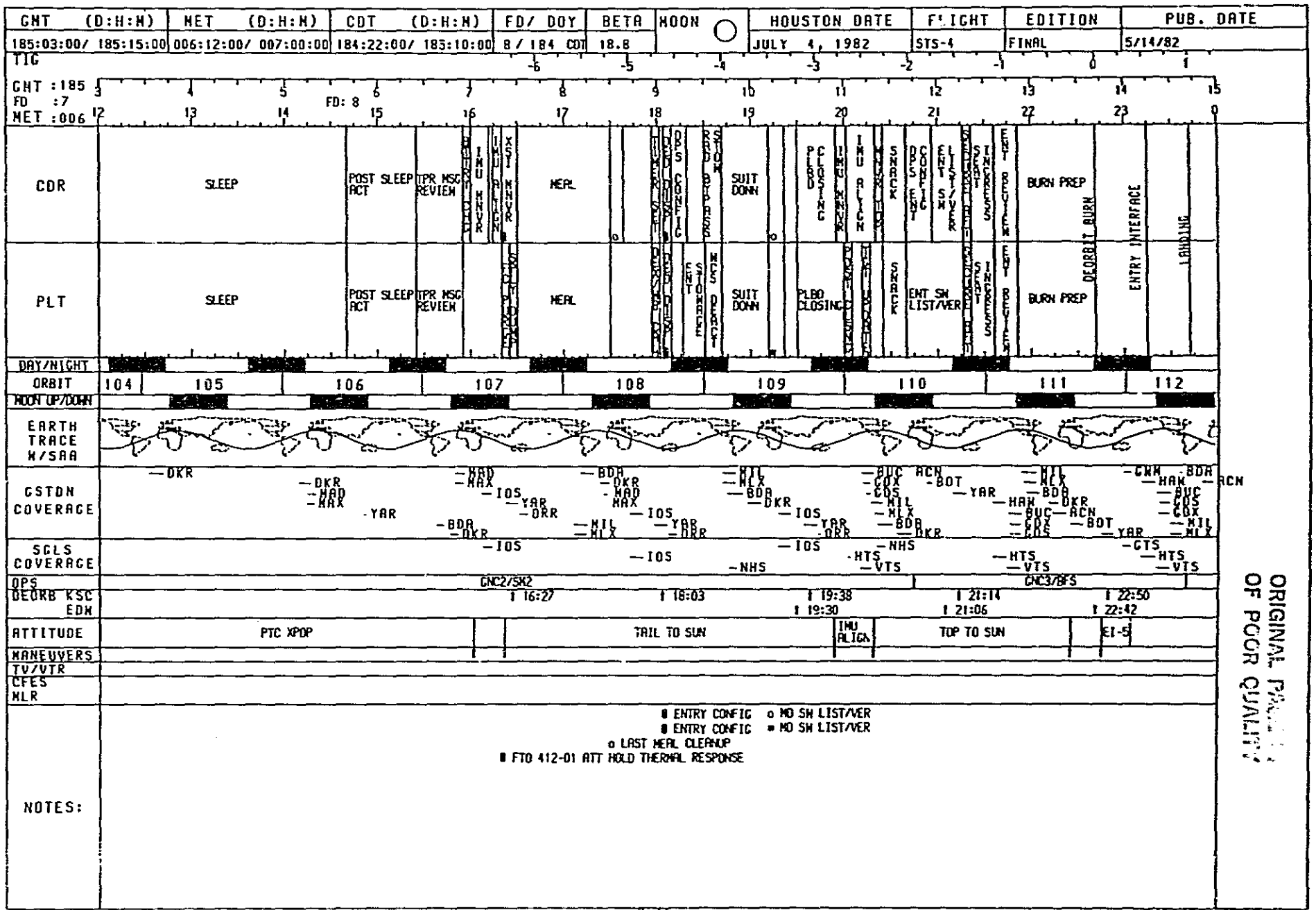

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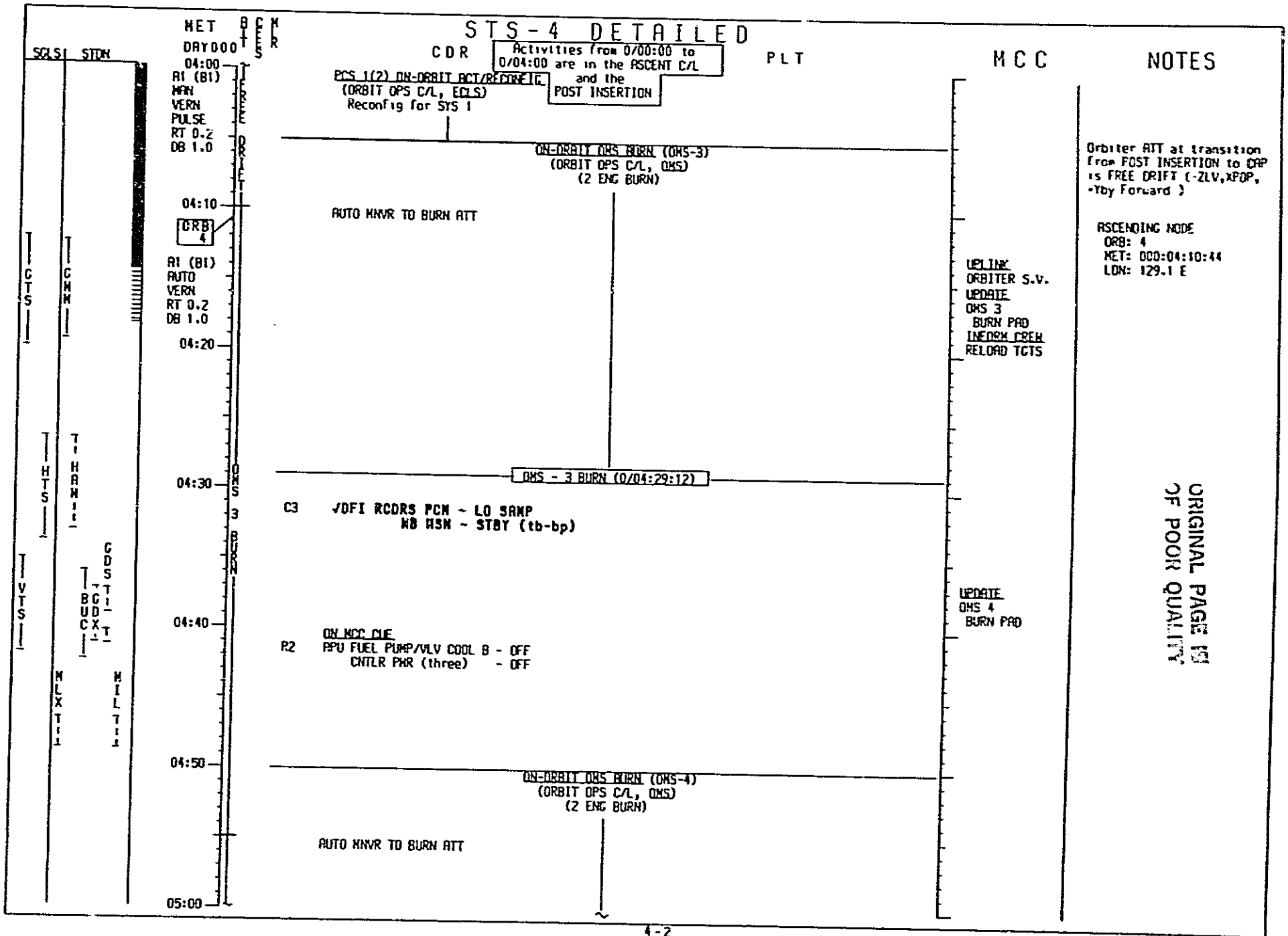
DETAILED TIMELINE

FLT DAY 1



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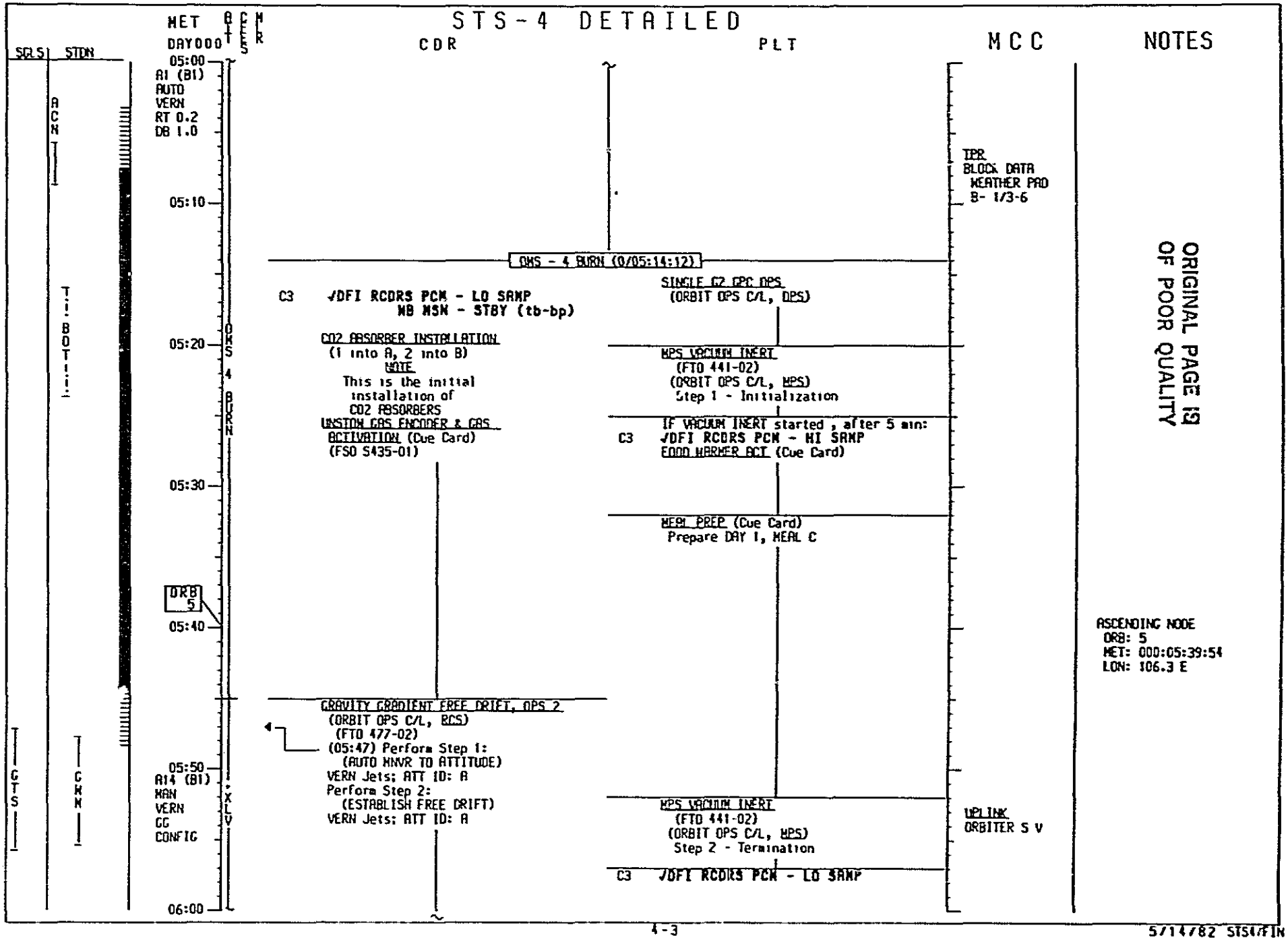
5/14/82 SIS4/FIN

STS-4 DETAILED



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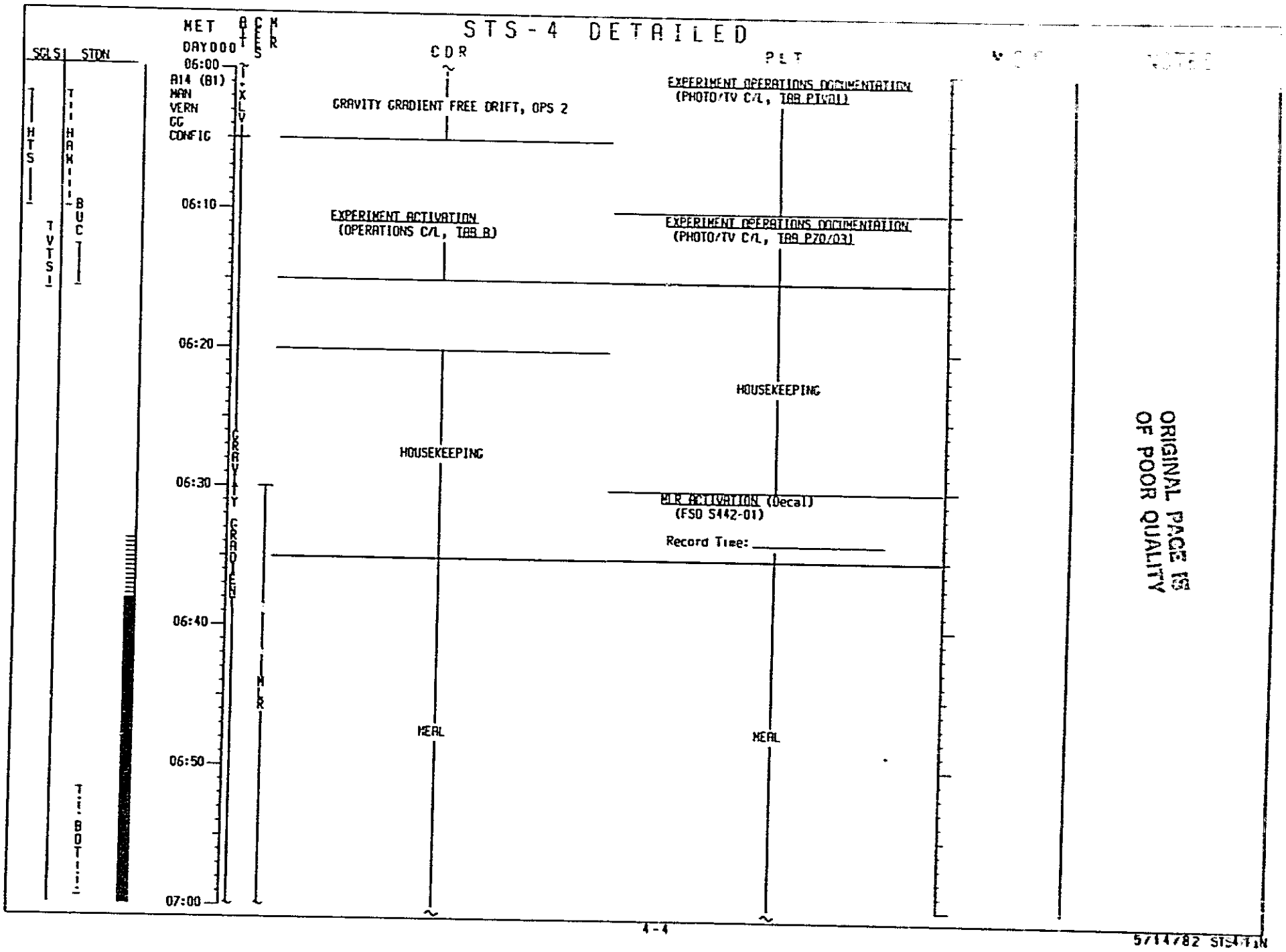
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY000
SGLS
STDN
06:00
A14 (B1)
MAN
VERN
CG
CONFIG
06:10
06:20
06:30
06:40
06:50
07:00
CDR
PLT
GRAVITY GRADIENT FREE DRIFT, OPS 2
EXPERIMENT ACTIVATION
(OPERATIONS C/L, TAB B)
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P17/21)
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P20/03)
HOUSEKEEPING
HOUSEKEEPING
MLR ACTIVATION (Decal)
(FSO S442-01)
Record Time:
MEAL
MEAL
ORIGINAL PAGE IS
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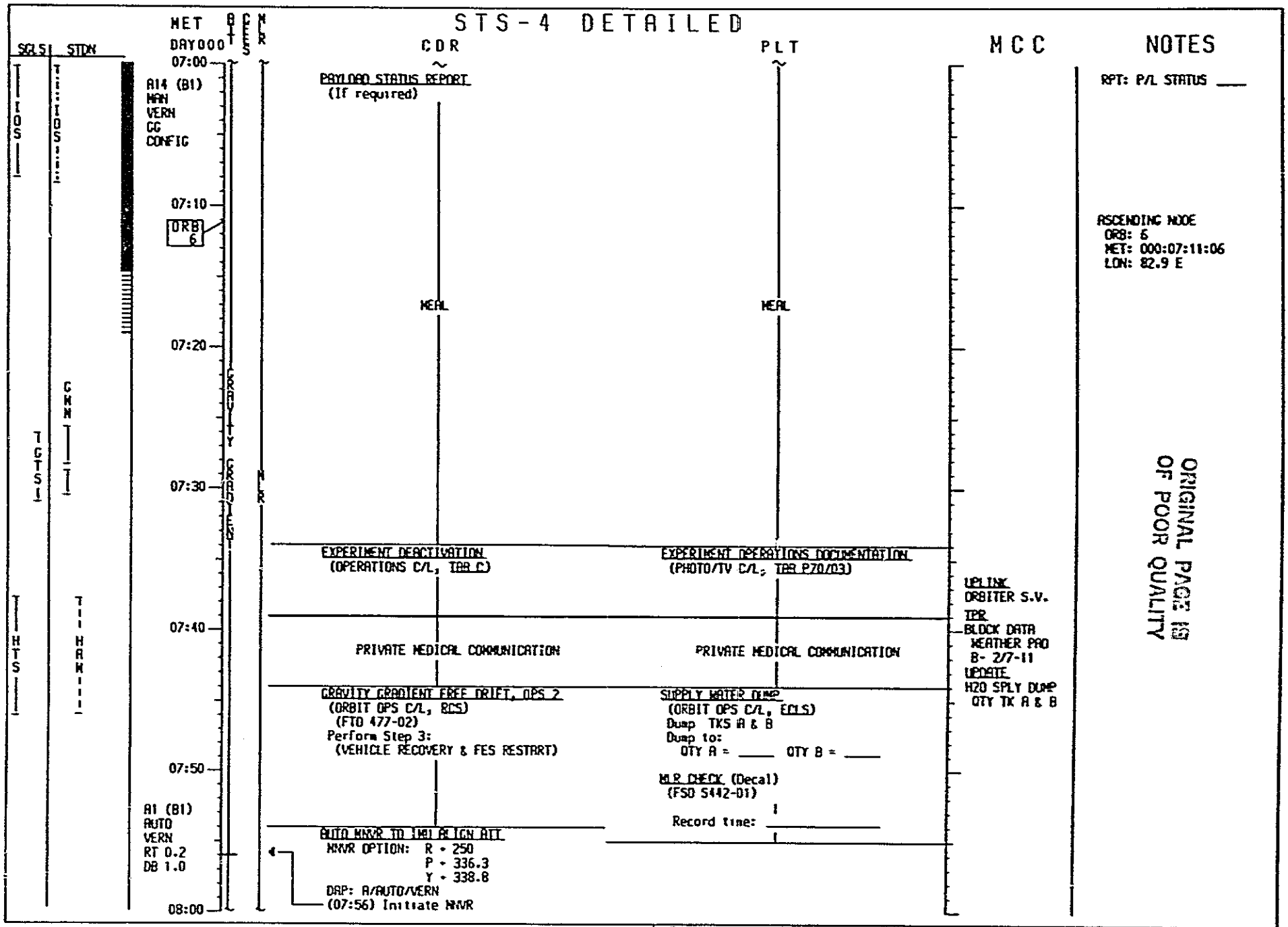

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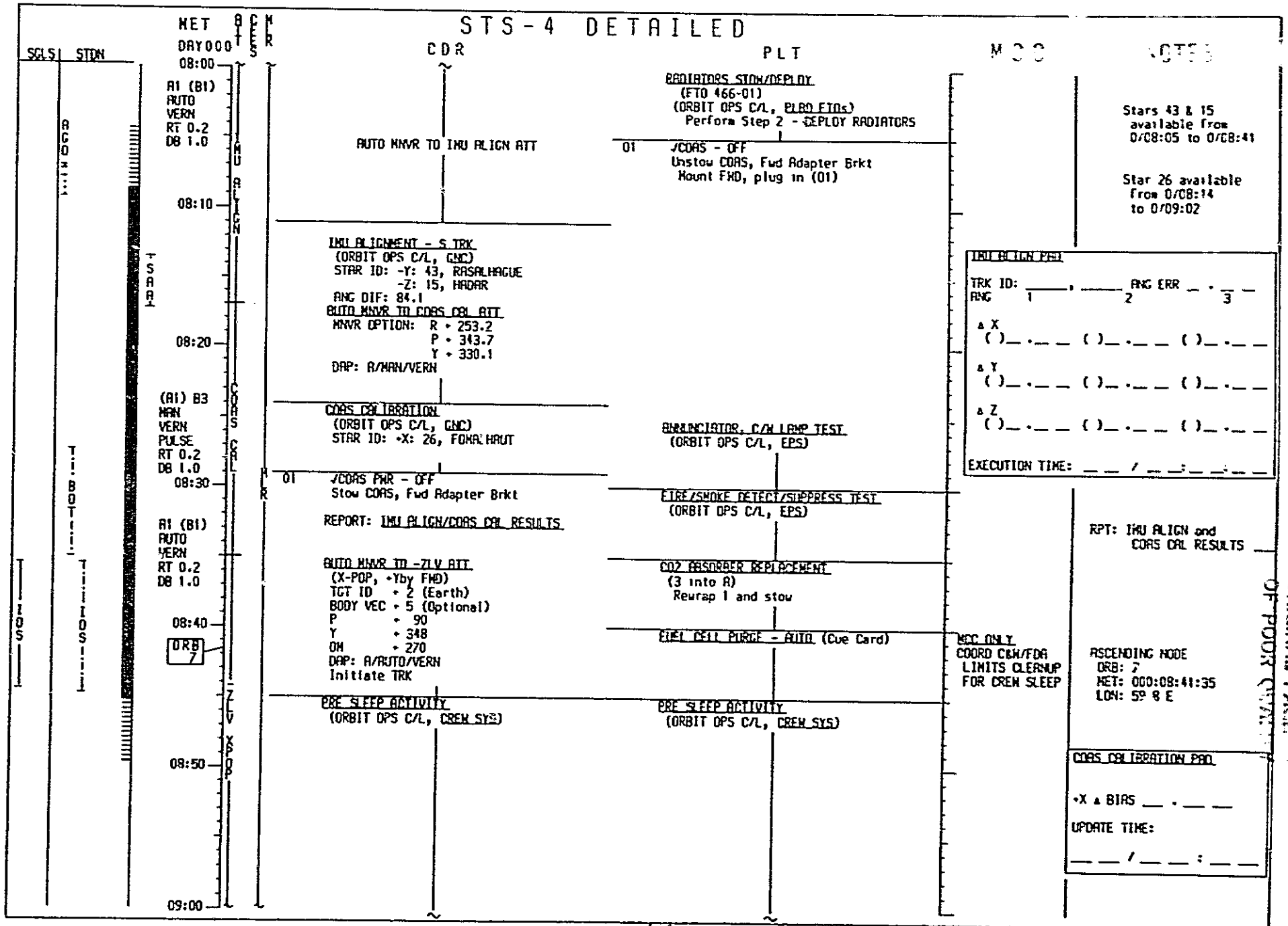
STS-4 DETAILED



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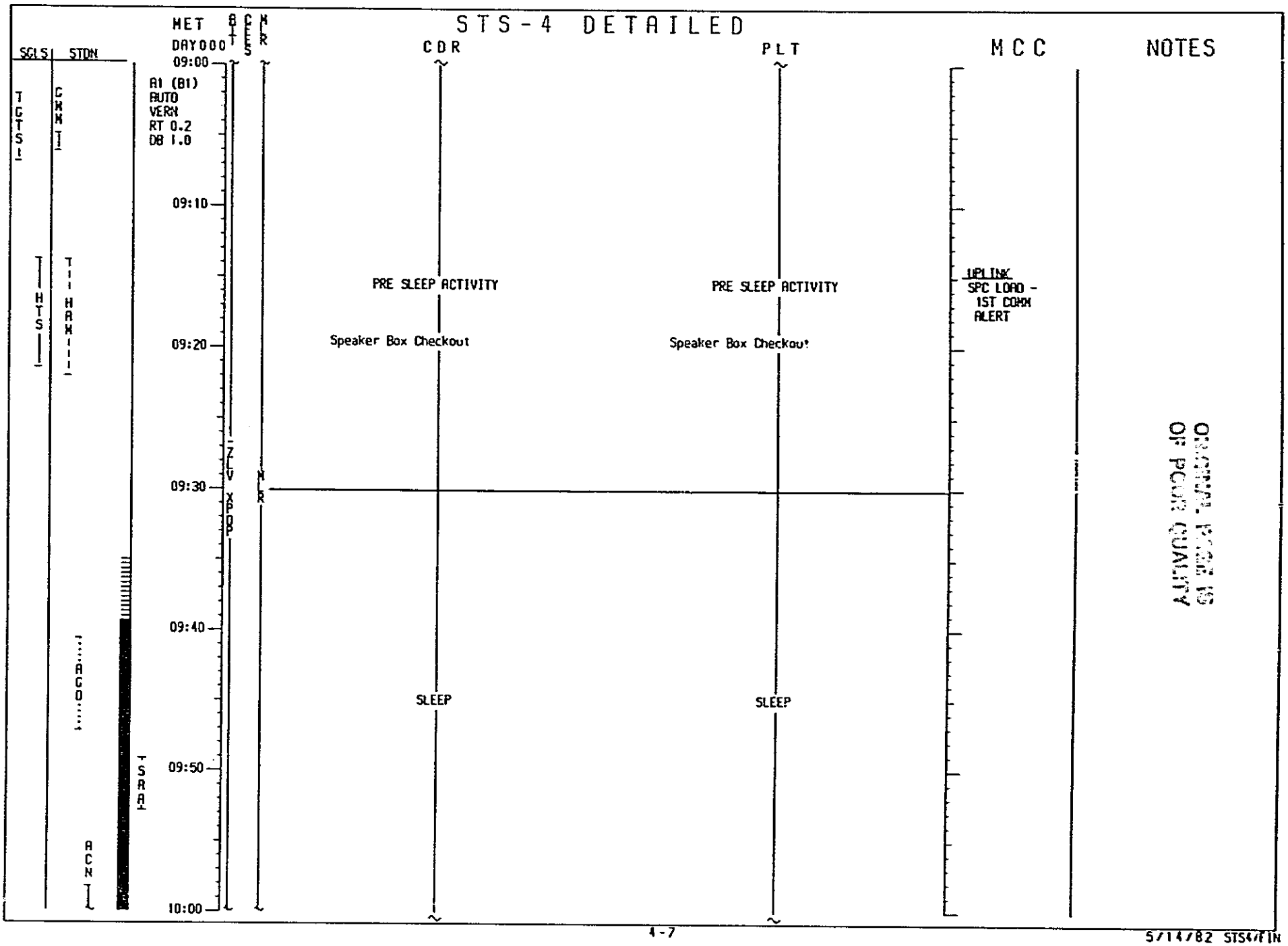
5/14/82 STS4/FIH


STS-4 DETAILED
MET
DAY000
09:00
09:10
09:20
09:30
09:40
09:50
10:00
SGLS
STDN
TGTS-1
GMT
HTS
T-0 MAX
AGO
ACN
TSRA
ATS
CCES
MCR
AI (BI)
AUTO
VERN
RT 0.2
DB 1.0
INJ
XPDR
MCR
CDR
PRE SLEEP ACTIVITY
Speaker Box Checkout
SLEEP
PLT
PRE SLEEP ACTIVITY
Speaker Box Checkout
SLEEP
MCC
UPLINK
SPC LOAD -
1ST COMM
ALERT
NOTES
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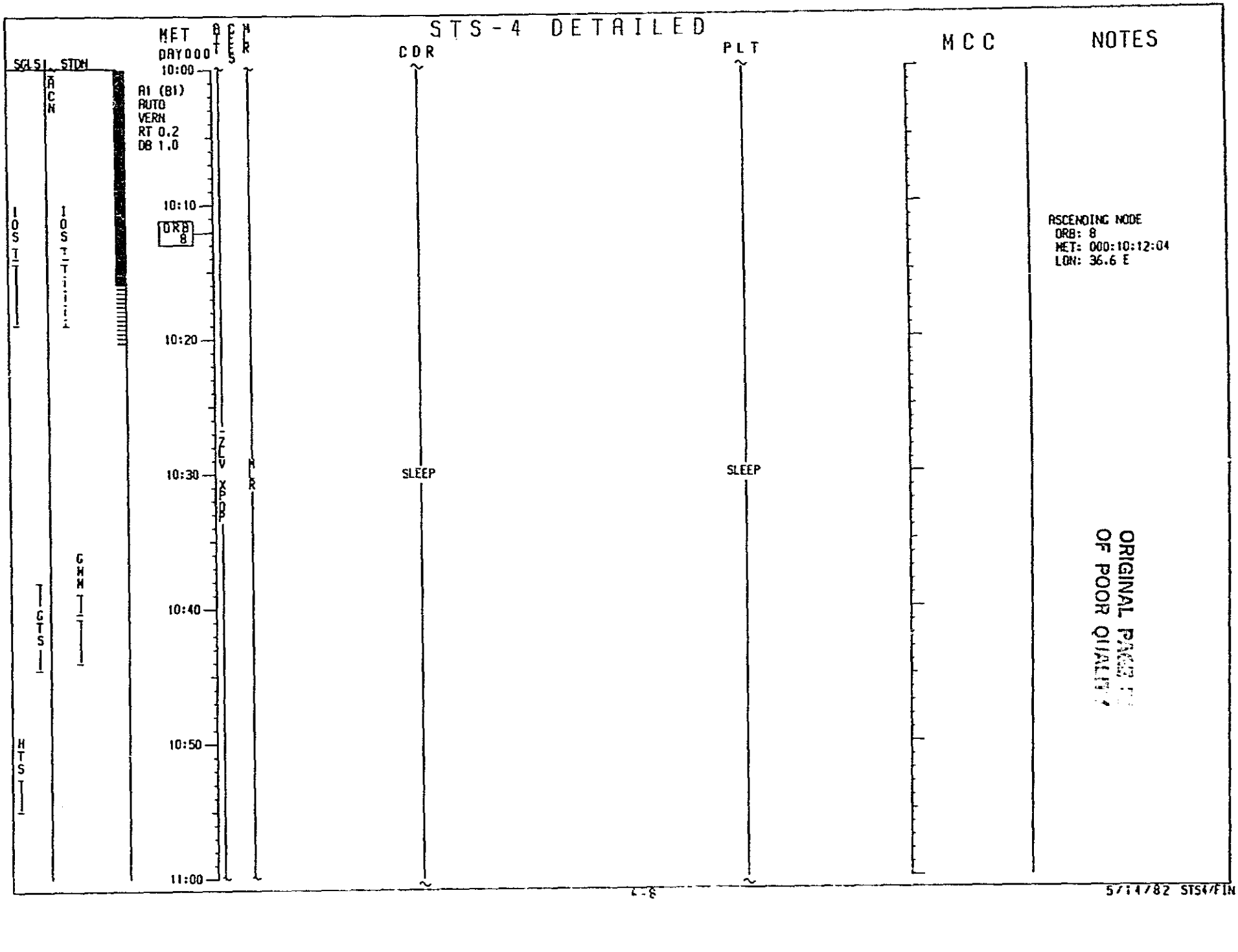
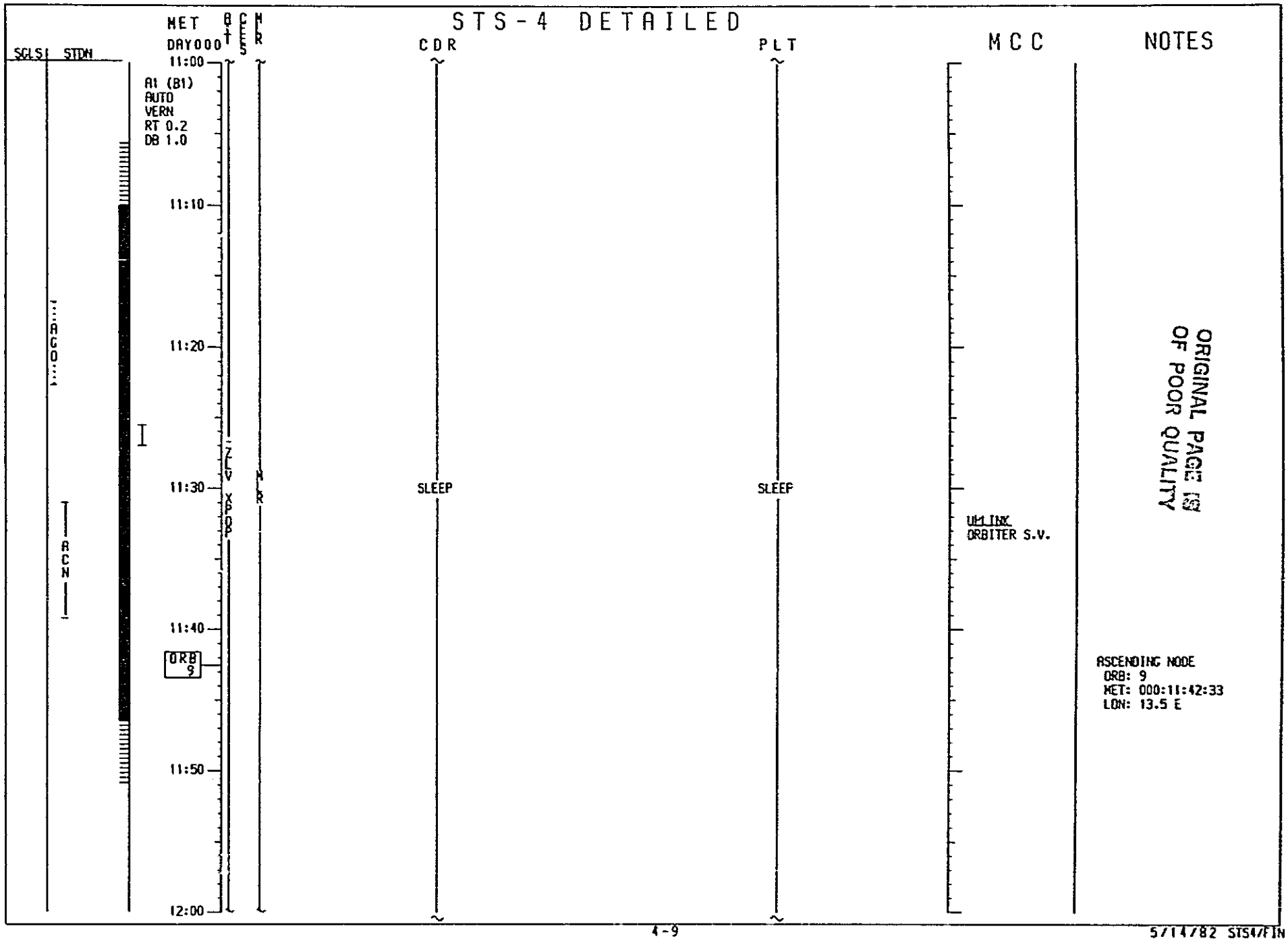

STS-4 DETAILED
MET
DAY000
10:00
10:10
10:20
10:30
10:40
10:50
11:00
SGLS
STDN
ACN
IOS
GTS
GXM
HTS
ATS
CSS
HR
AI (BI)
AUTO
VERN
RT 0.2
DB 1.0
ORB 8
INLV
XPDR
CDR
PLT
SLEEP
SLEEP
MCC
NOTES
ASCENDING NODE
ORB: 8
MET: 000:10:12:04
LON: 36.6 E
ORIGINAL PAGE IS
OF POOR QUALITY
5/14/82 STS4/FIN



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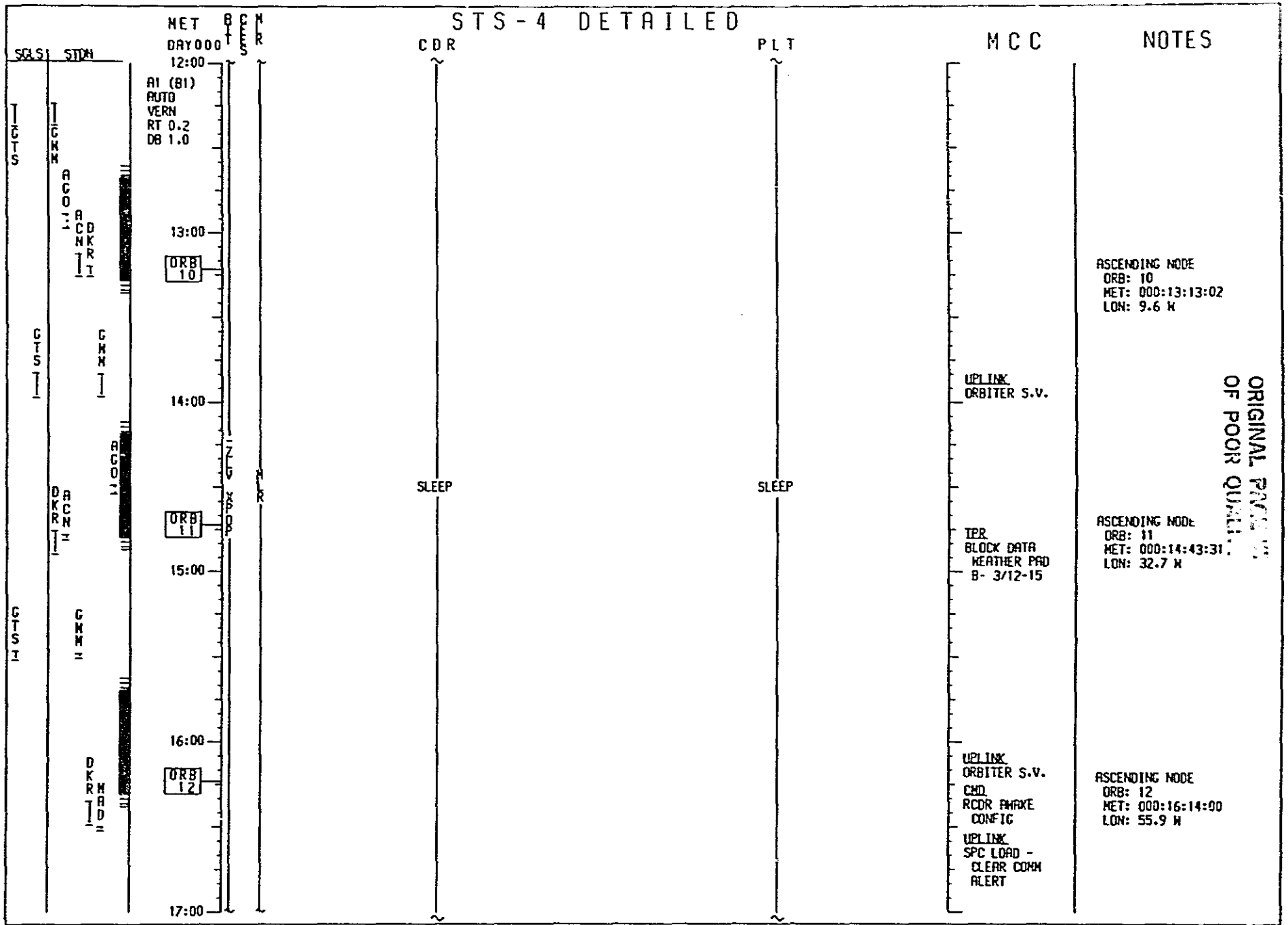
FLT DAY 2


STS-4 DETAILED
MET
DAY 000
SGLS
STDN
BFS
GLR
MLR
CDR
PLT
MCC
NOTES
12:00
13:00
14:00
15:00
16:00
17:00
AI (81)
AUTO
VERN
RT 0.2
DB 1.0
GTS
GMM
ACO
ACNT
DKRT
ORB 10
ORB 11
ORB 12
SLEEP
SLEEP
UPLINK
ORBITER S.V.
TPR
BLOCK DATA
KEATHER PRD
B- 3/12-15
UPLINK
ORBITER S.V.
CMD
RCDR RMAXE
CONFIG
UPLINK
SPC LOAD -
CLEAR COMM
ALERT
ASCENDING NODE
ORB: 10
MET: 000:13:13:02
LON: 9.6 W
ASCENDING NODE
ORB: 11
MET: 000:14:43:31
LON: 32.7 W
ASCENDING NODE
ORB: 12
MET: 000:16:14:00
LON: 55.9 W
ORIGINAL PAGE IS
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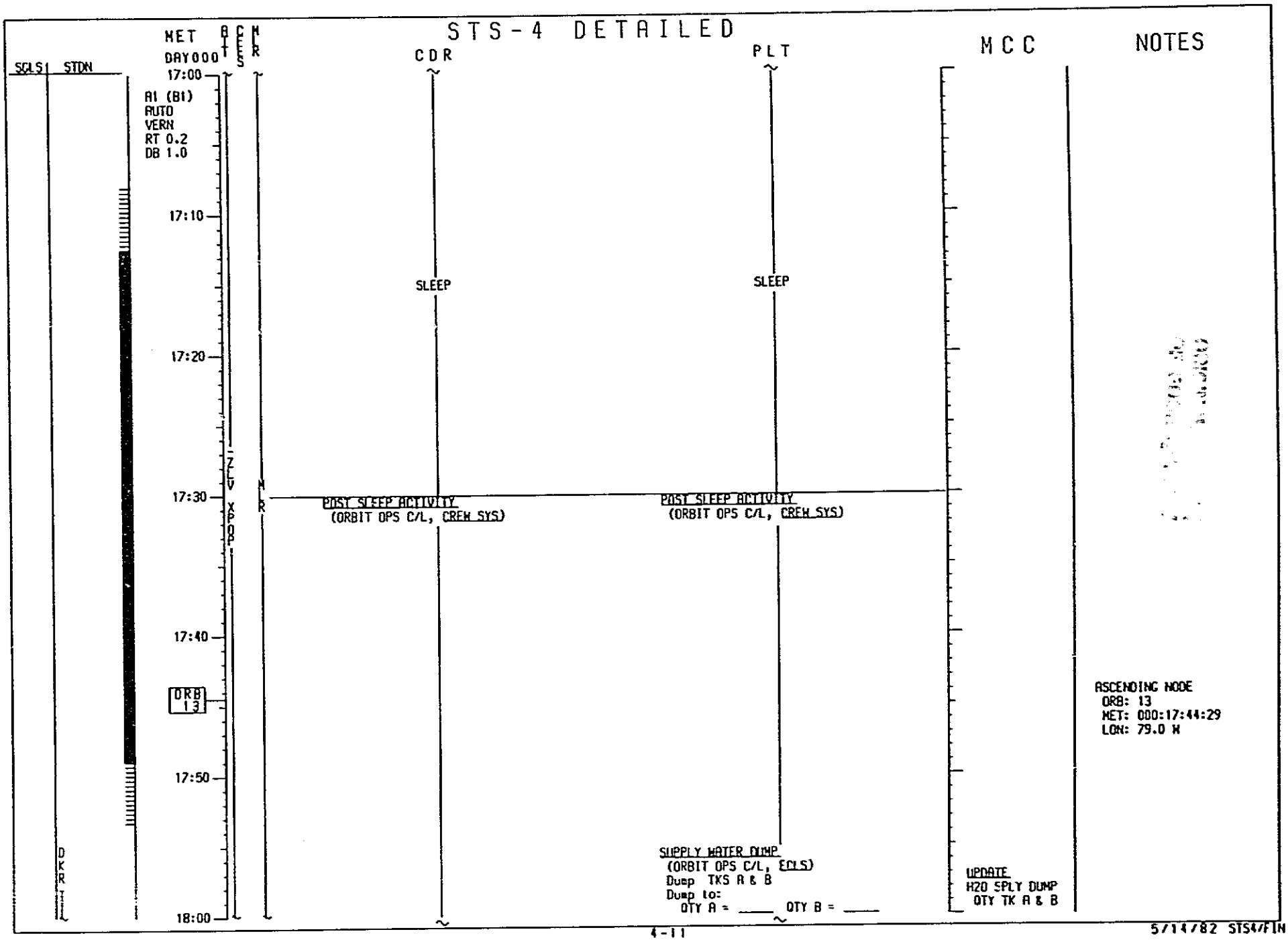
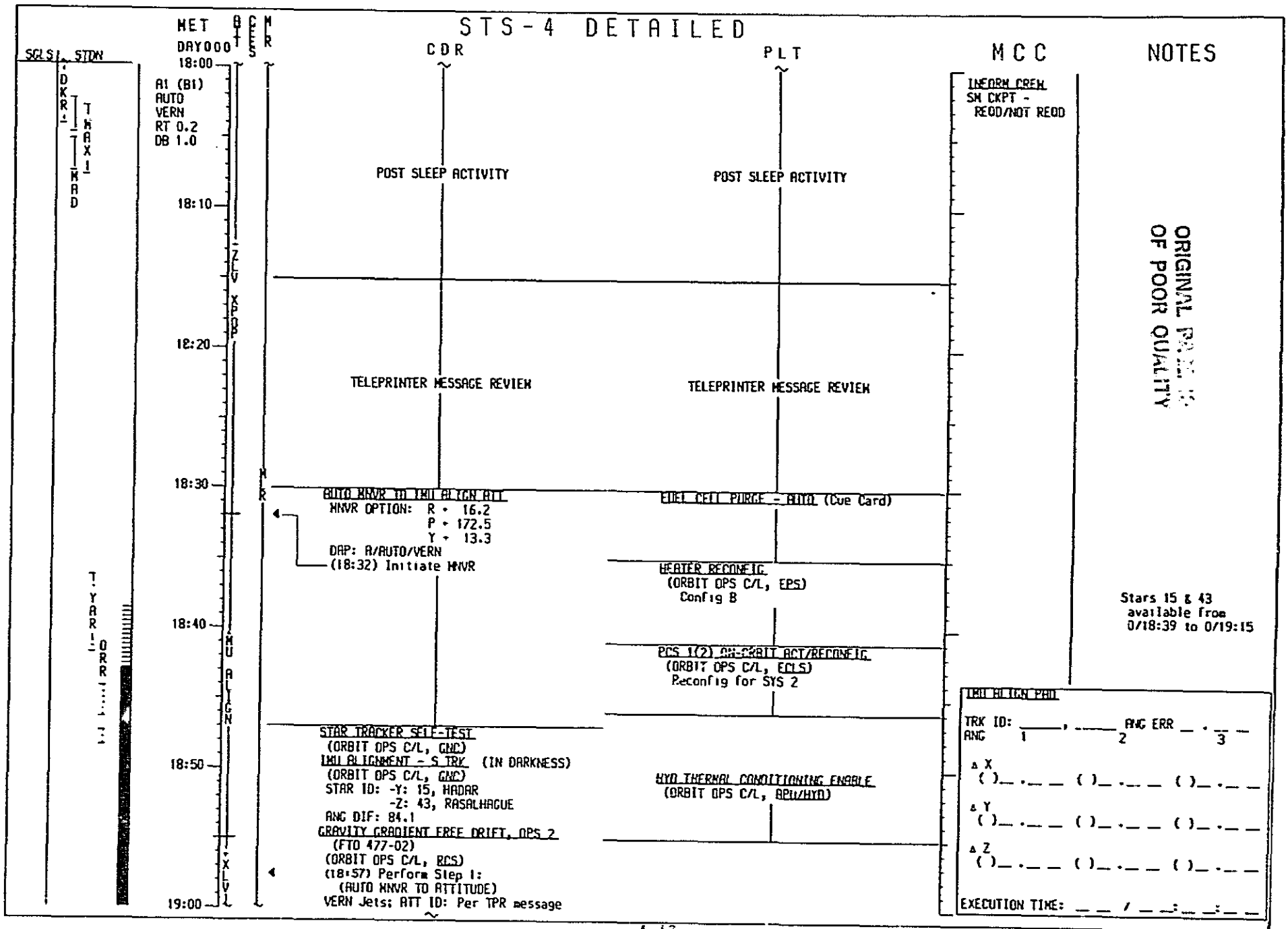
STS-4 DETAILED



5/14/82 STS4/FIN

STS-4 DETAILED



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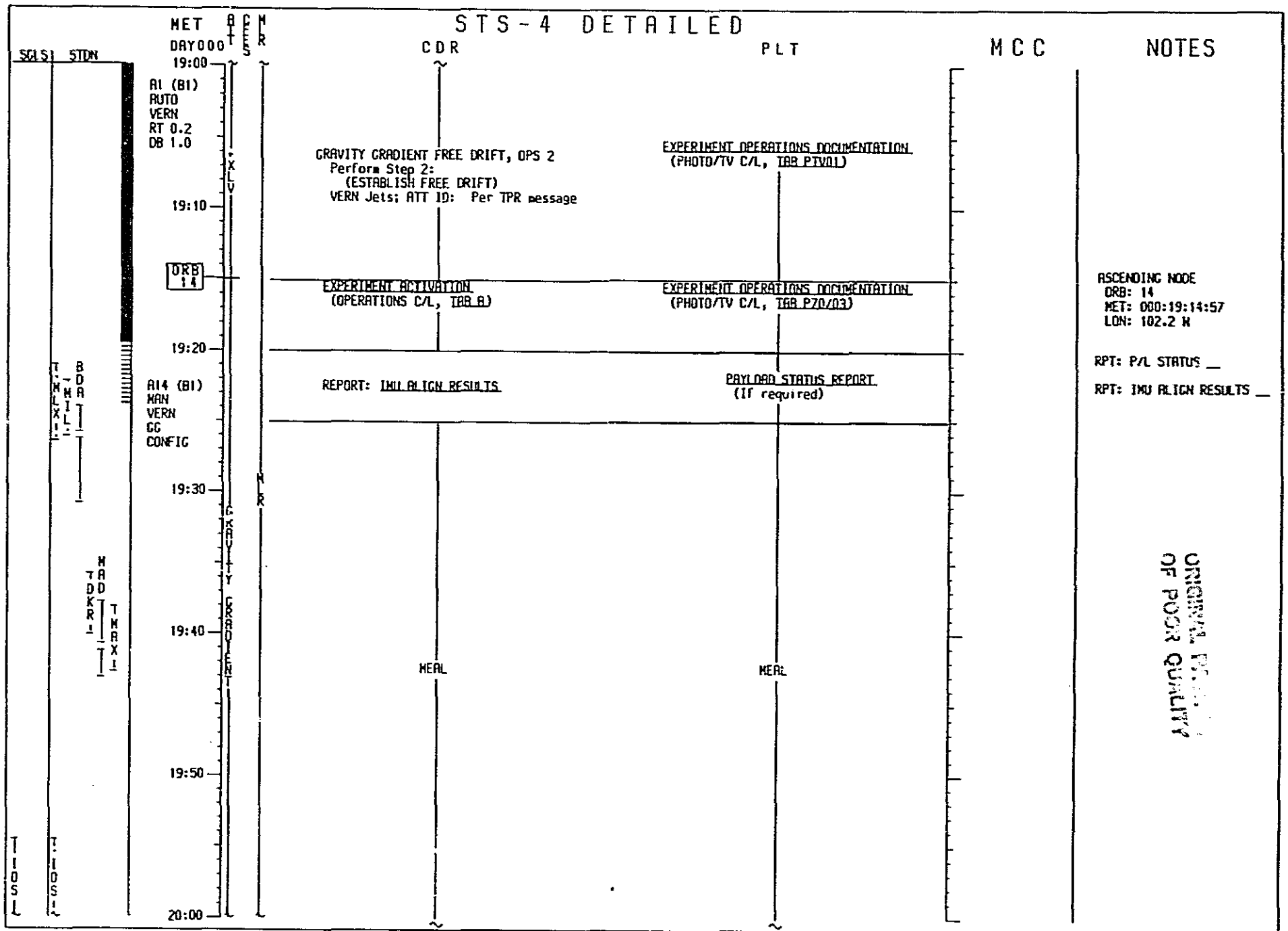
5/14/82 STS4/FIN

STS-4 DETAILED



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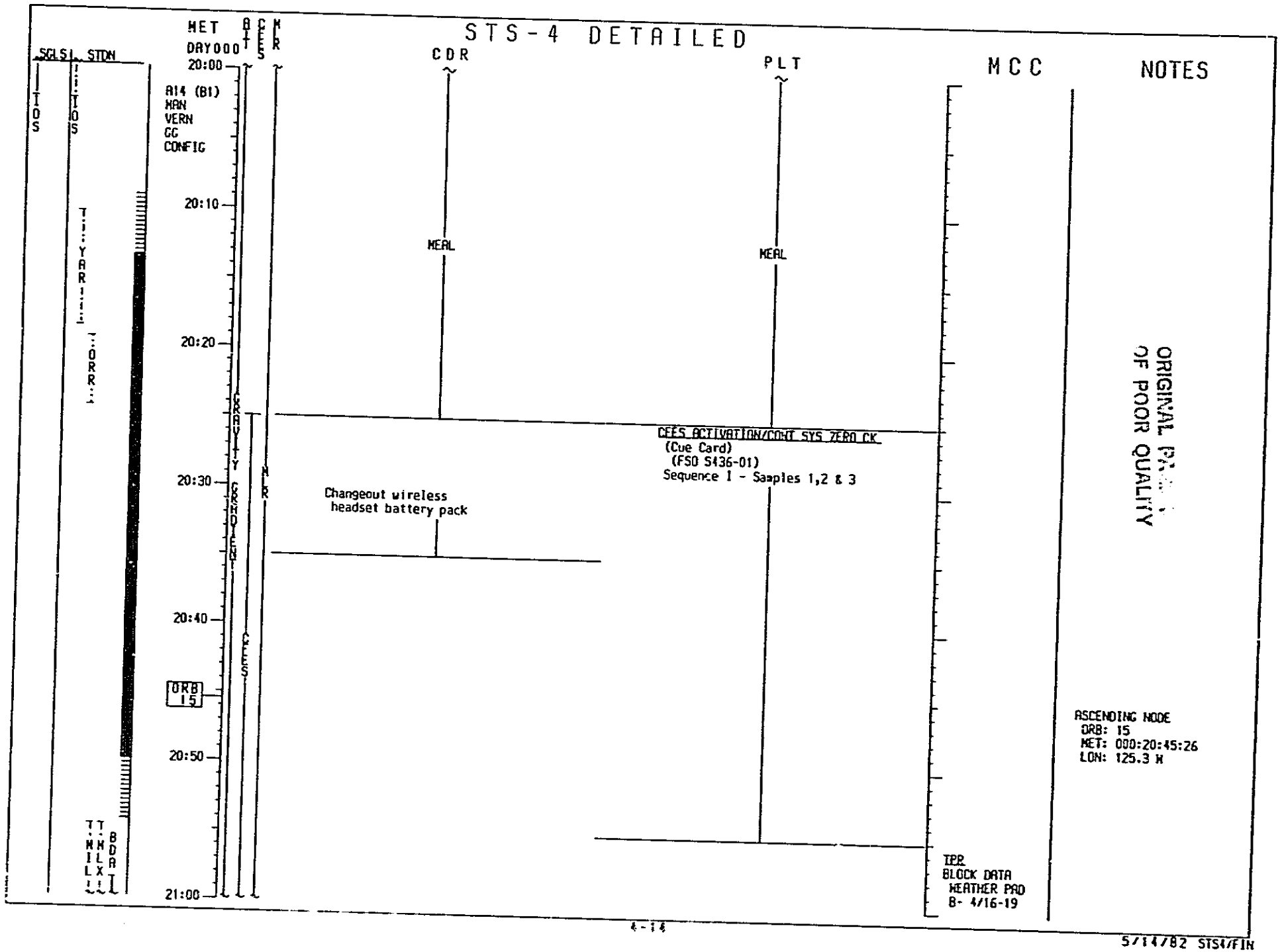
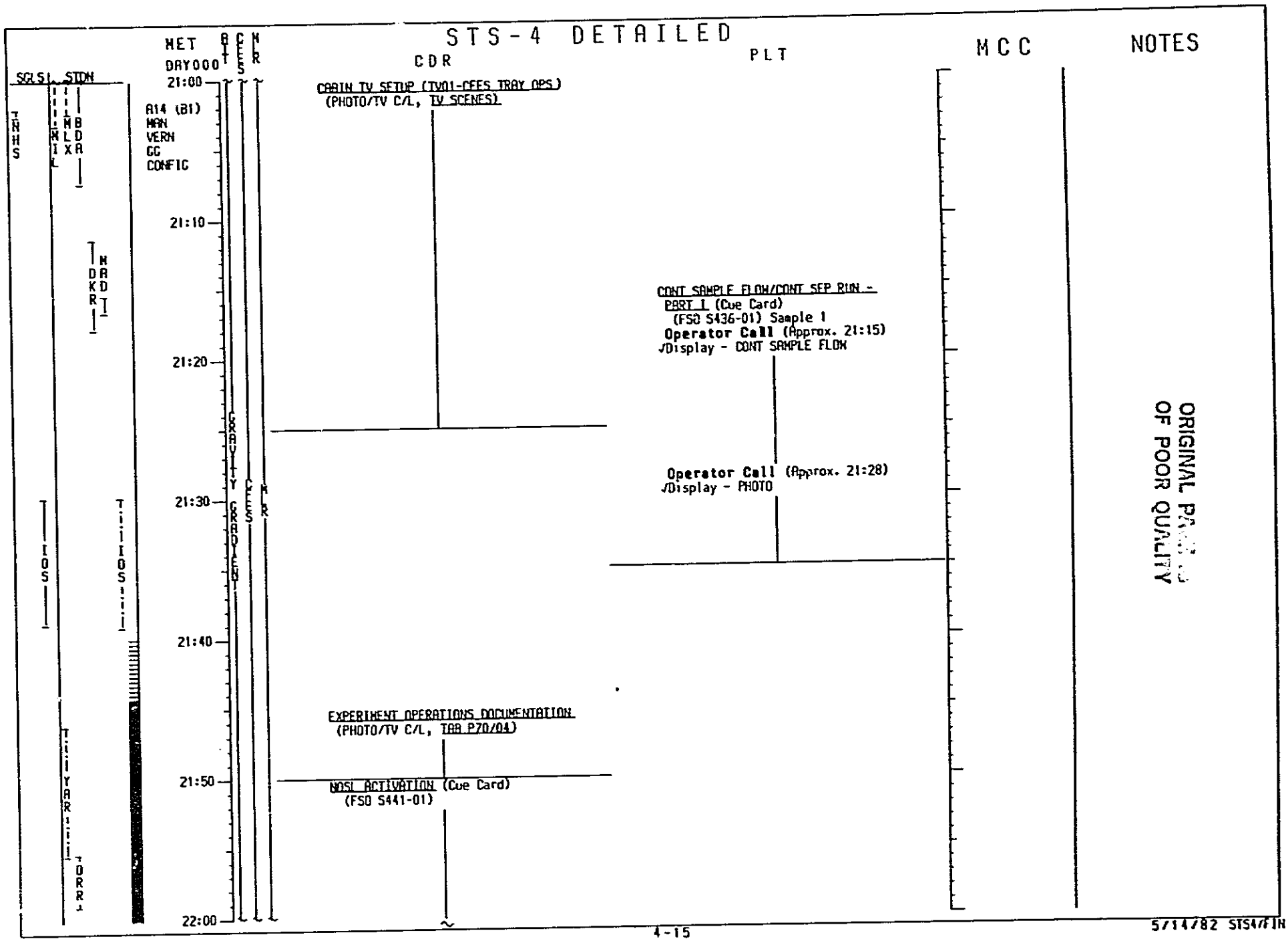
5/14/82 STS4/FIN



5/14/82 STS4/FIN

STS-4 DETAILED



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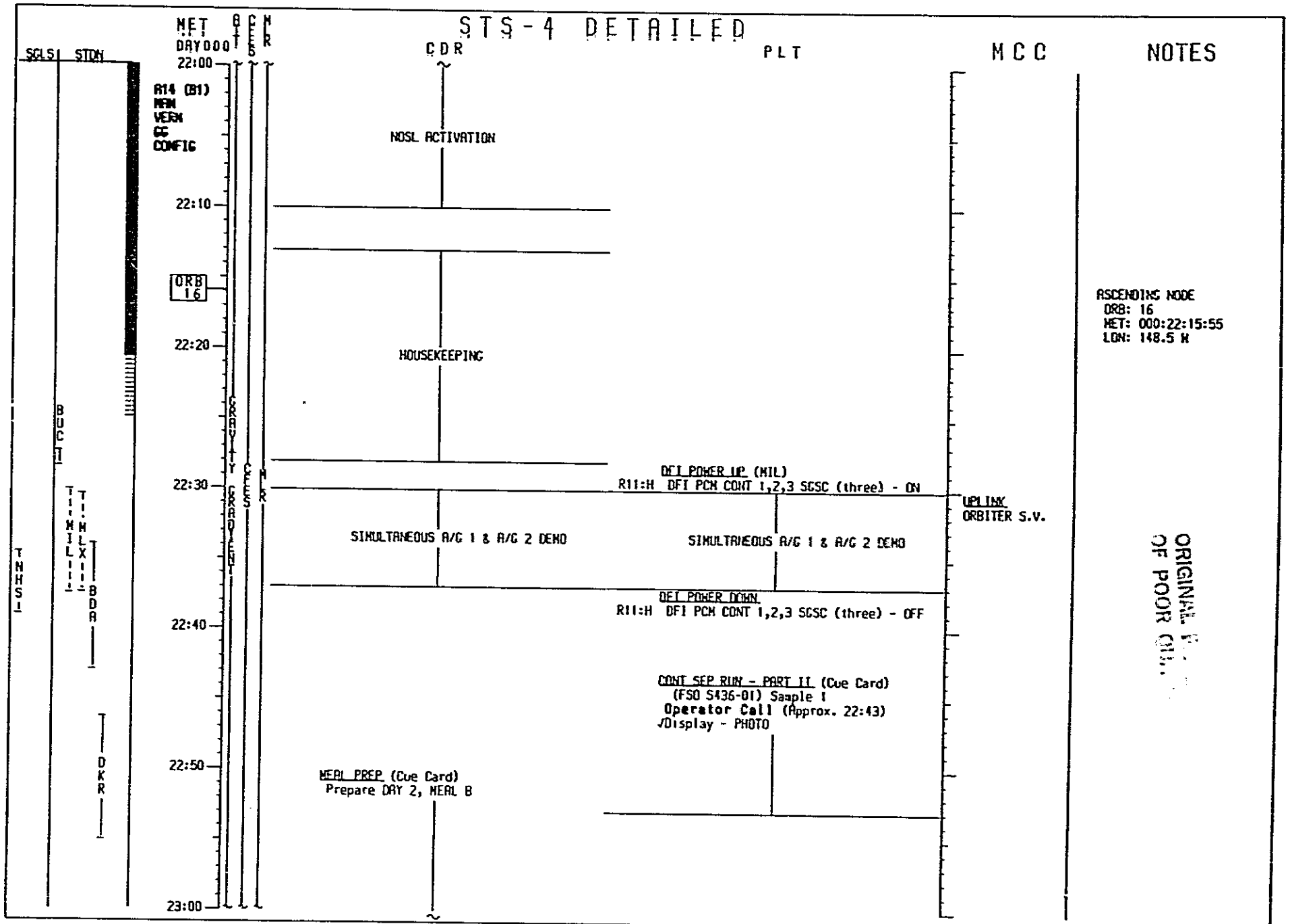
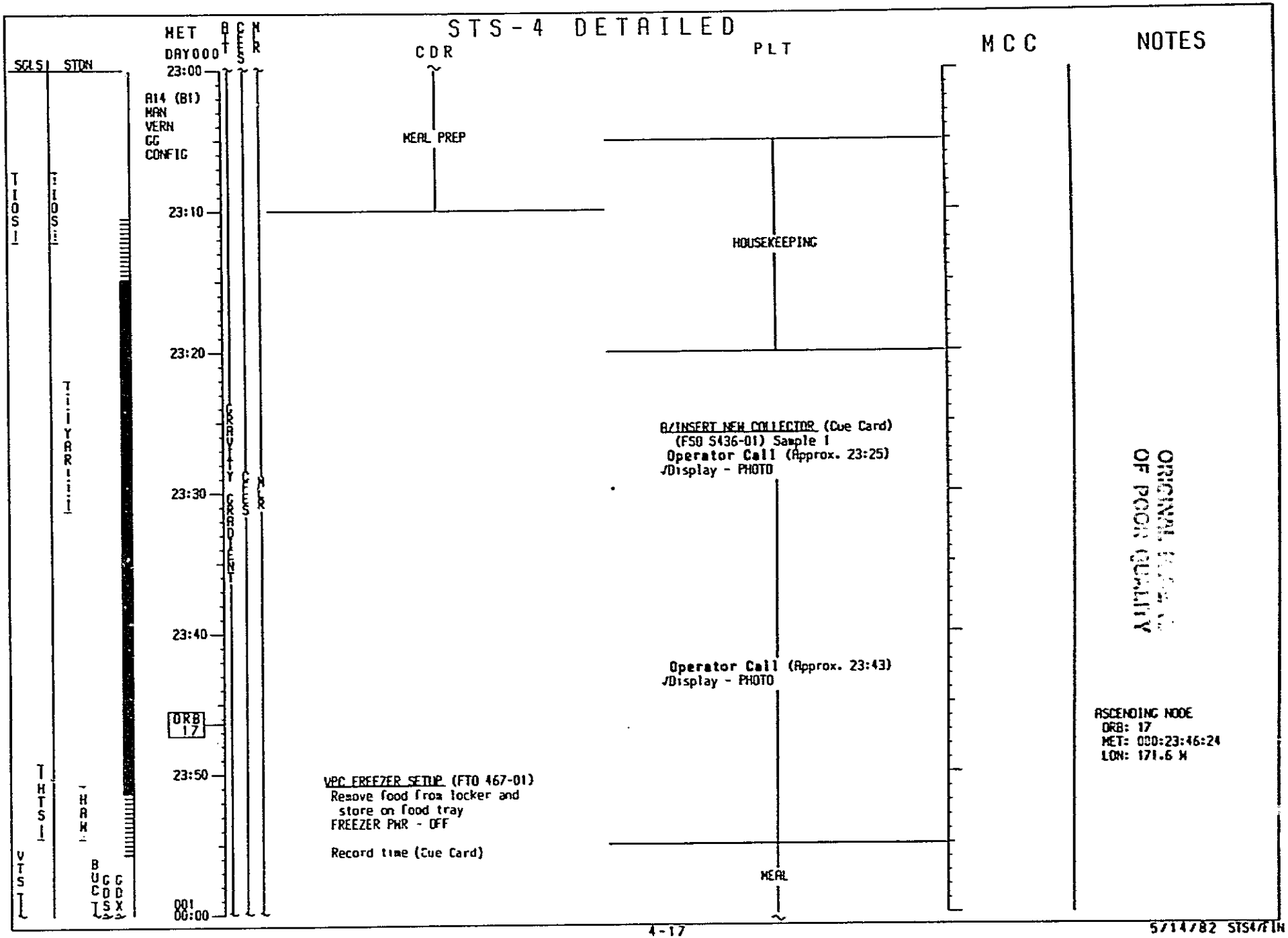
5/14/82 STS4/FIN



5/14/82 STS4/FIN

STS-4 DETAILED



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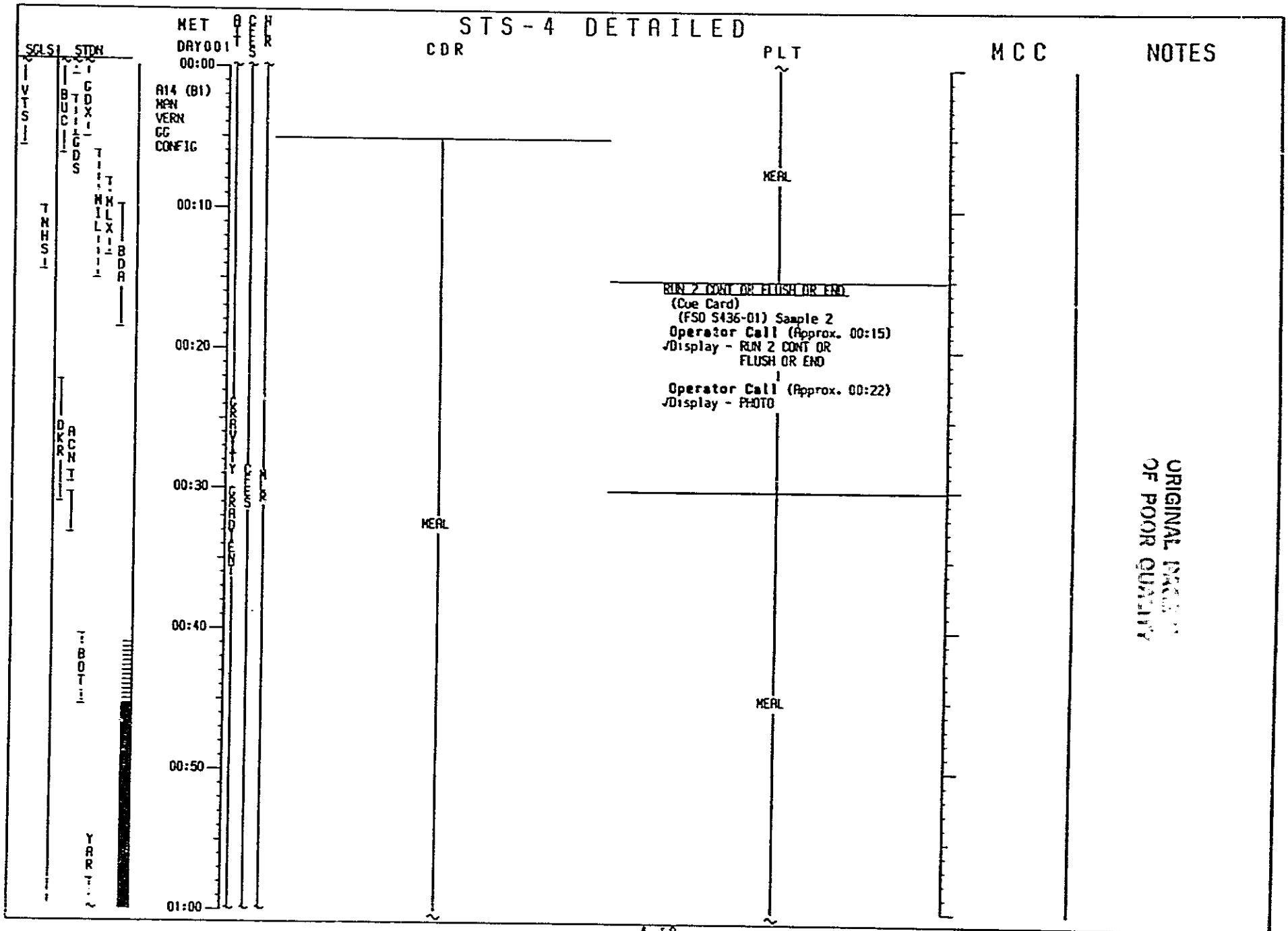
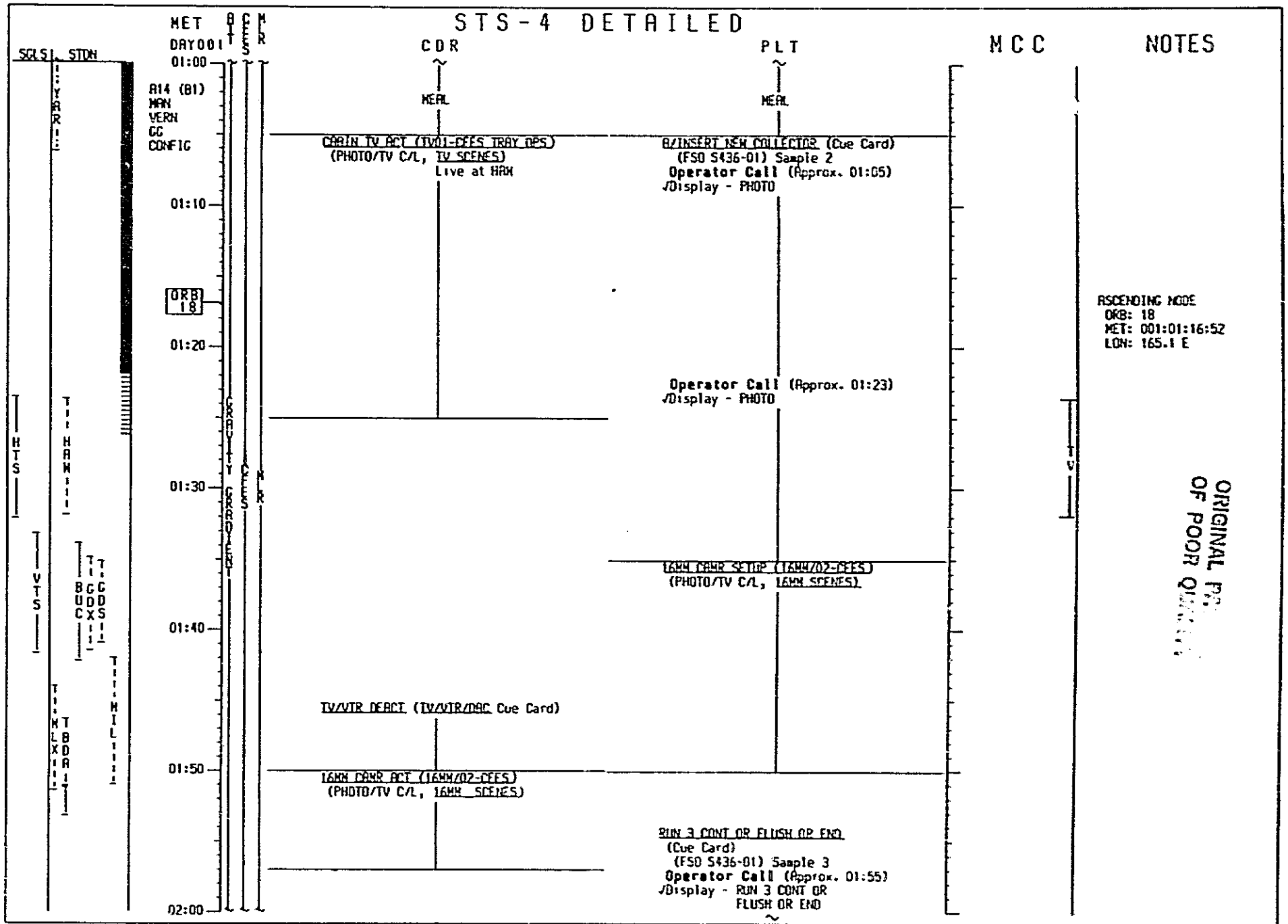
5/14/82 STS4/FIN

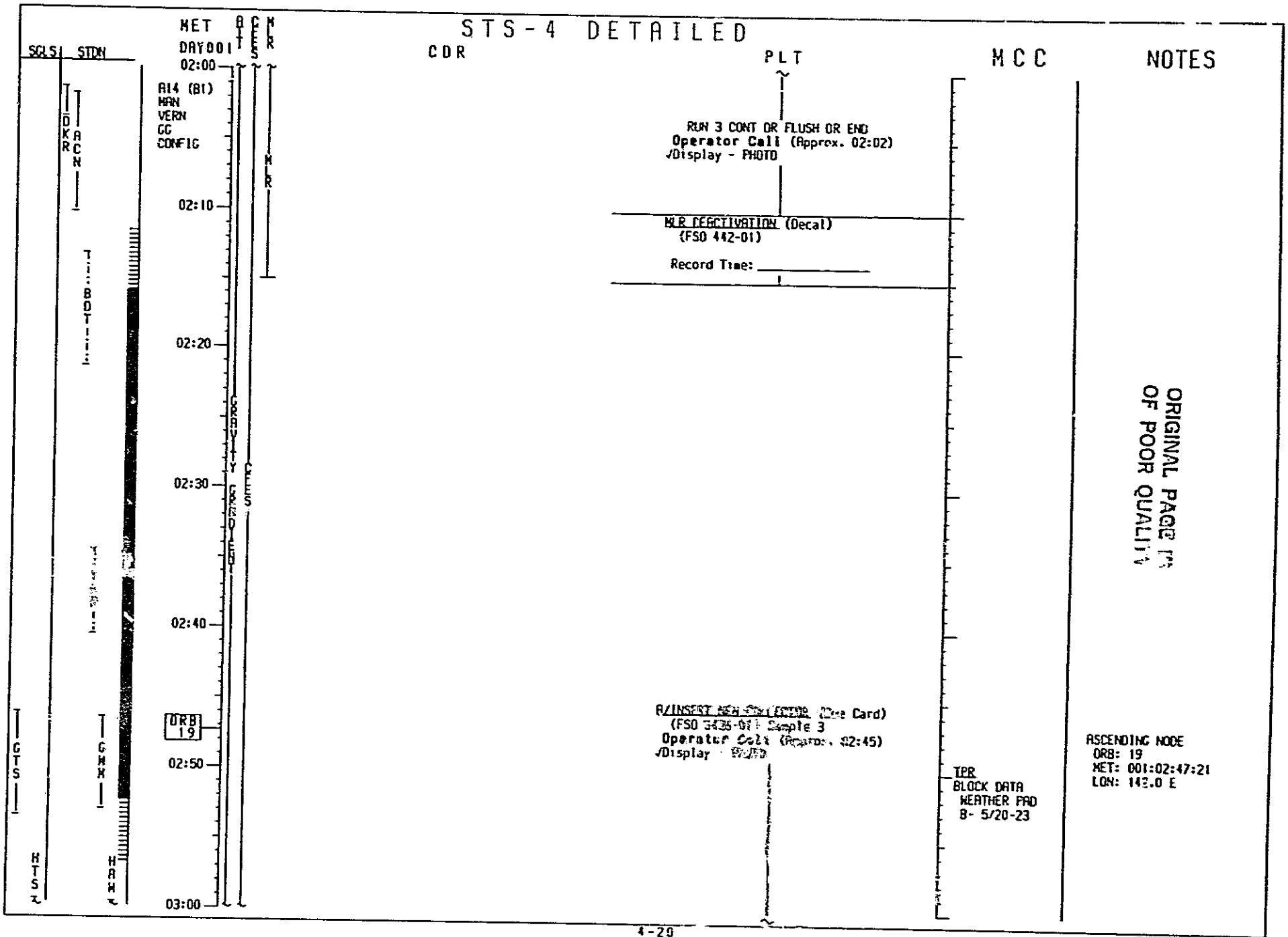

STS-4 DETAILED
MET
DAY001
SCLS
STDN
VTS
BUC
TDRS
GDX
TILS
MILS
MLX
TNHS
BDA
DKR
ACNT
BOT
YAR
BIT
CCUS
HLR
00:00
00:10
00:20
00:30
00:40
00:50
01:00
A14 (B1)
MAN
VERN
GG
CONFIG
CDR
PLT
MCC
NOTES
MEAL
RUN 2 CONT OR FLUSH OR END
(Cue Card)
(FSO S436-01) Sample 2
Operator Call (Approx. 00:15)
√Display - RUN 2 CONT OR
FLUSH OR END
Operator Call (Approx. 00:22)
√Display - PHOTO
MEAL
MEAL
ORIGINAL PAGE IS
OF POOR QUALITY

STS-4 DETAILED



5/14/82 STS-4 FIN

STS-4 DETAILED



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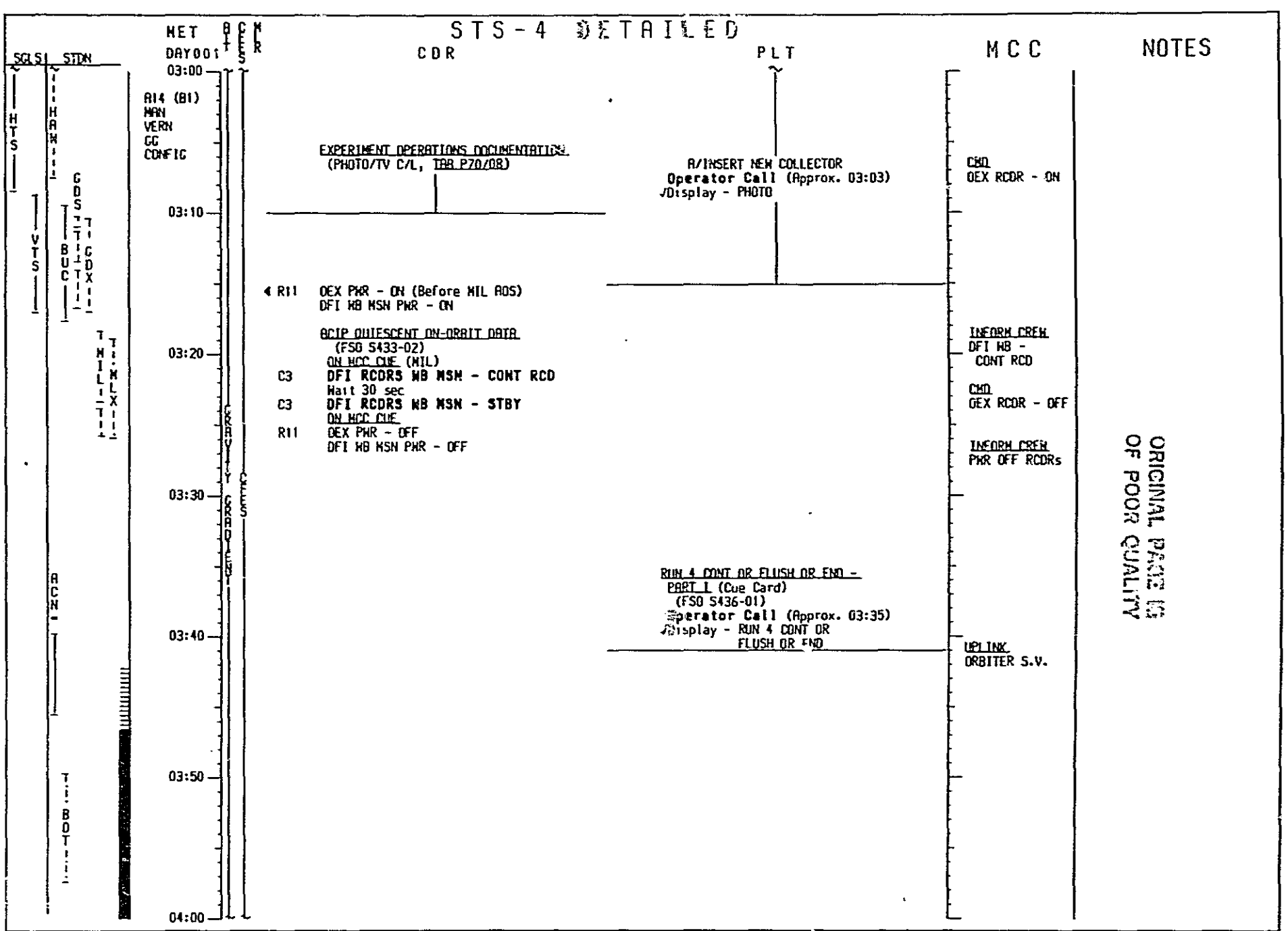
5/14/82 STS4/FIN

STS-4 DETAILED



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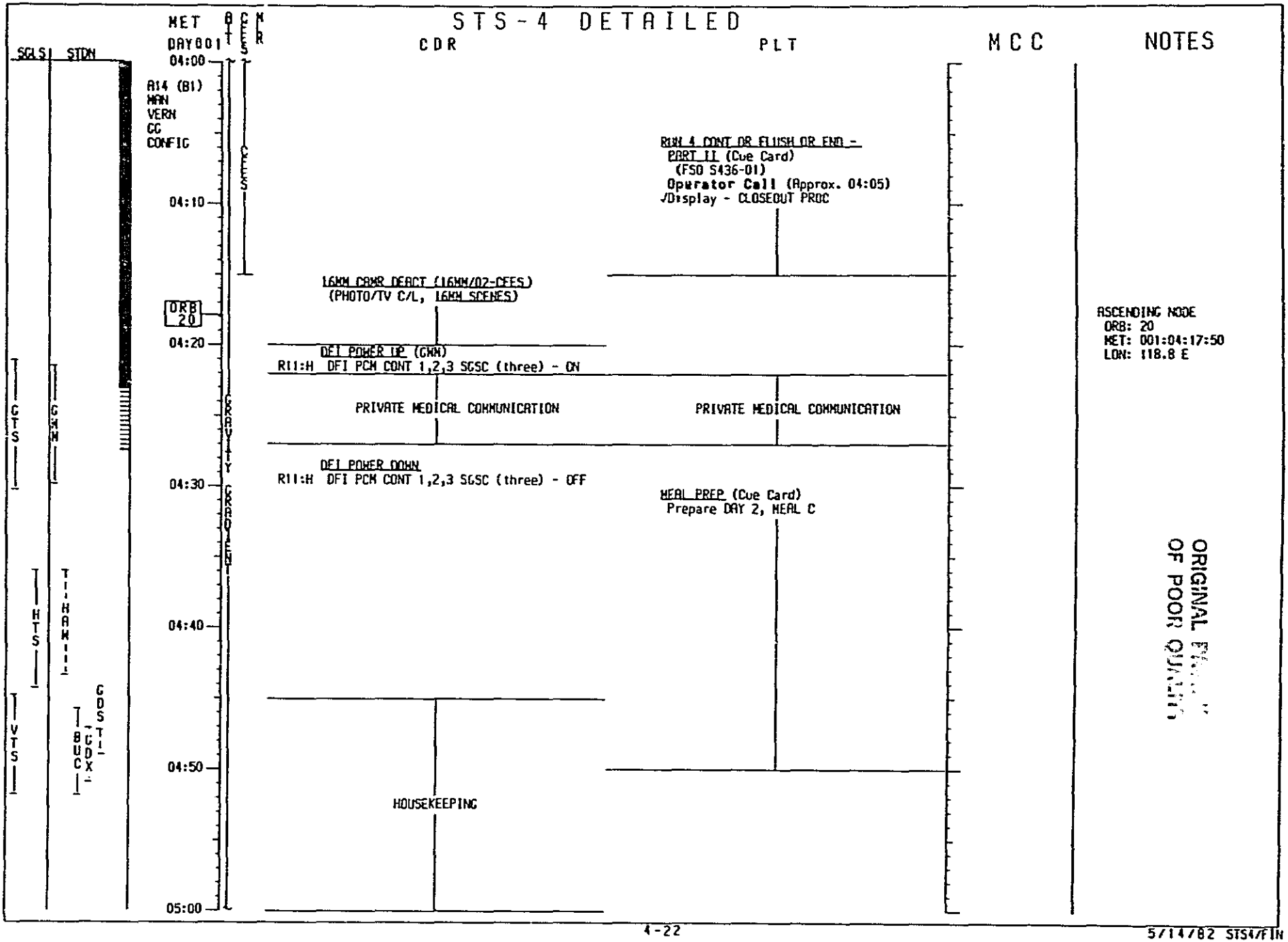

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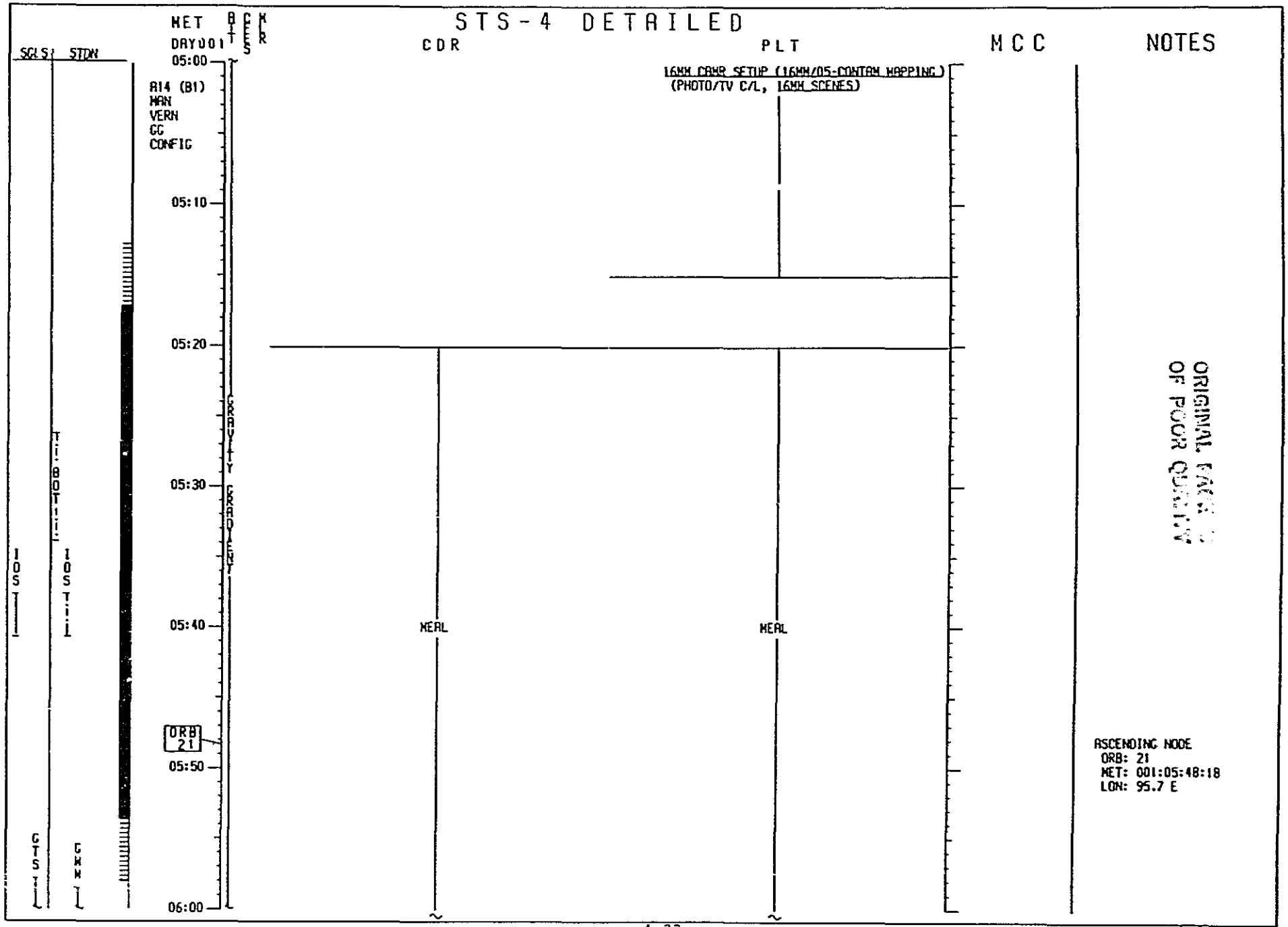
STS-4 DETAILED



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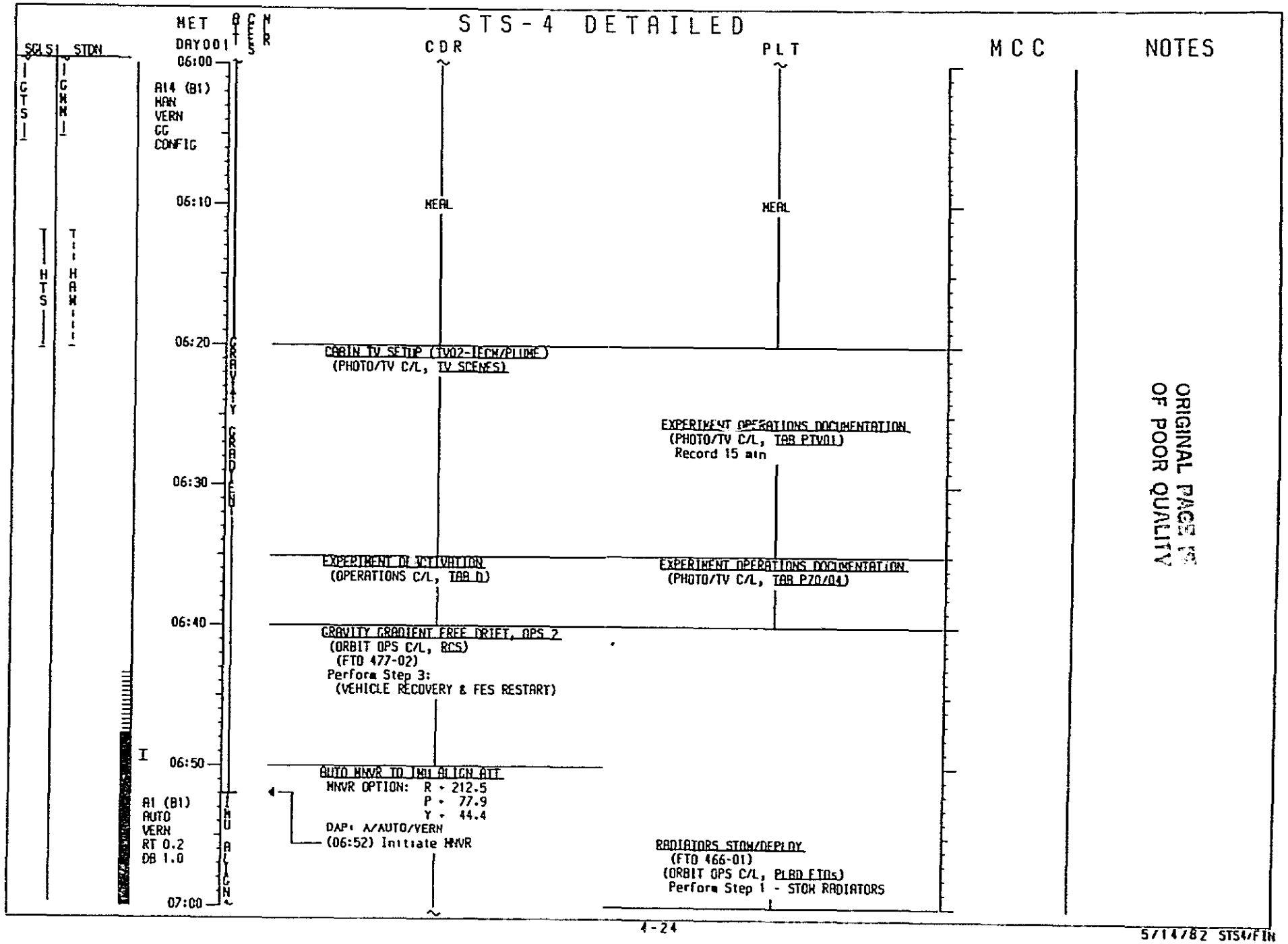
STS-4 DETAILED



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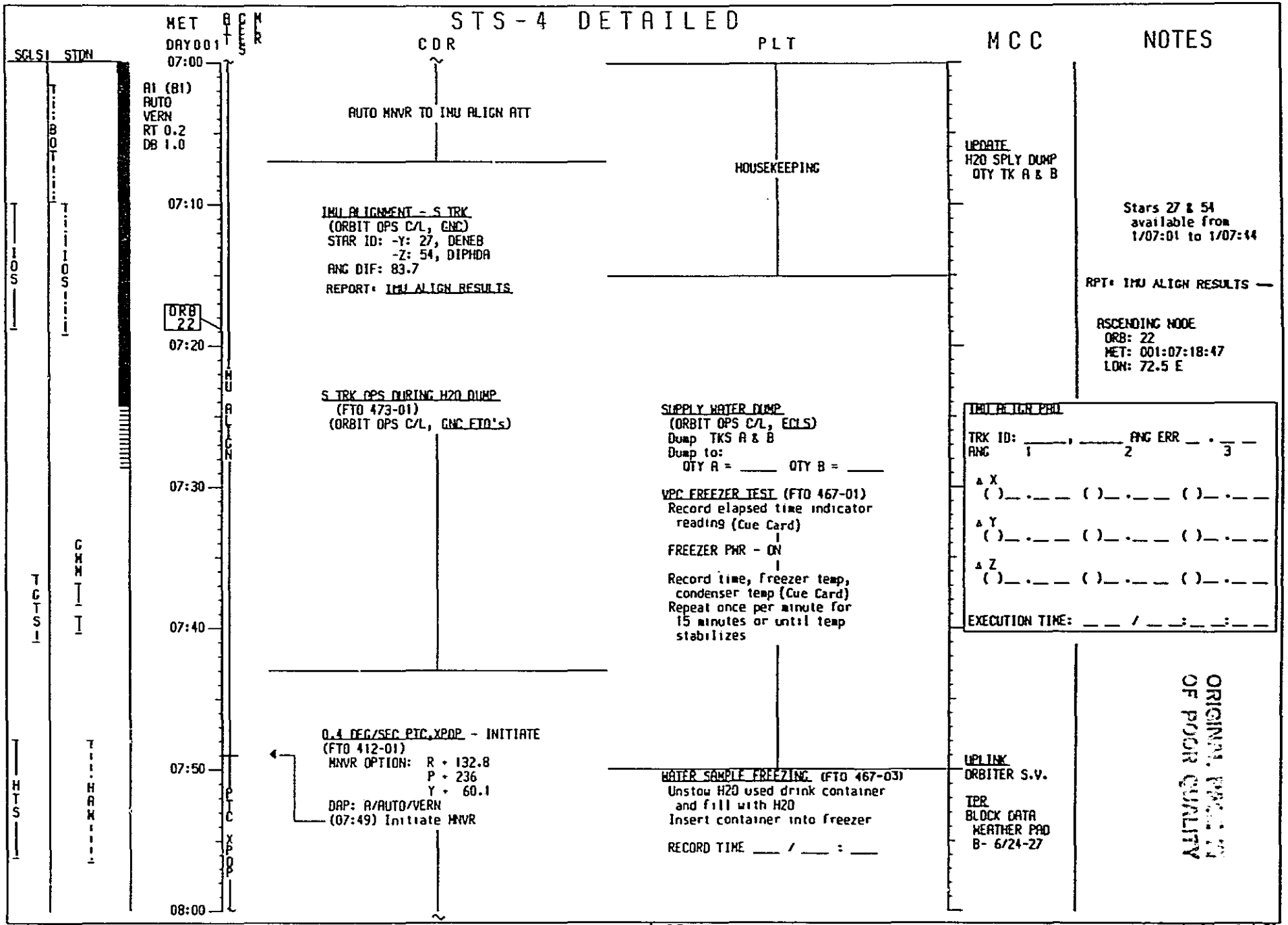
STS-4 DETAILED



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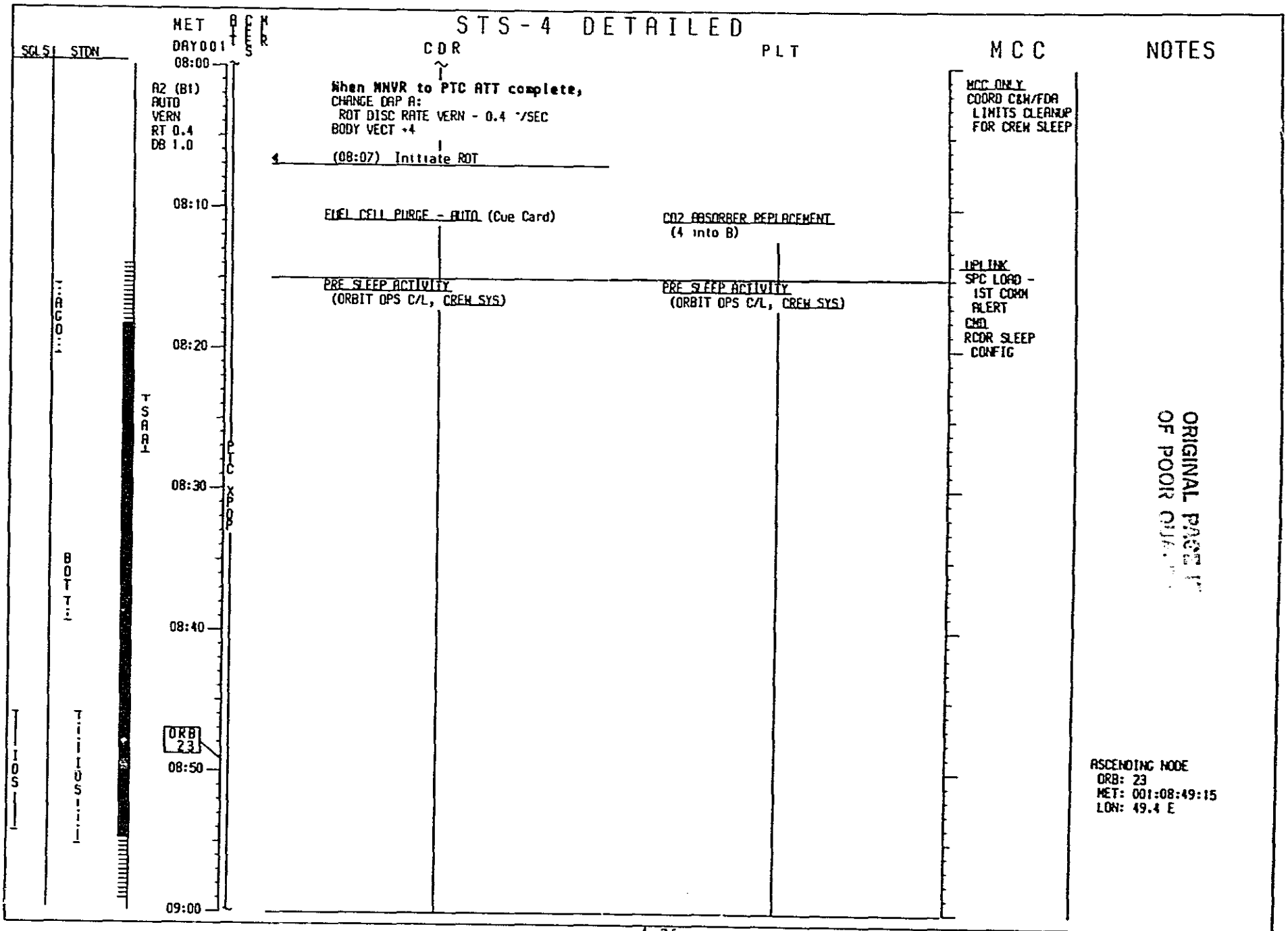
STS-4 DETAILED



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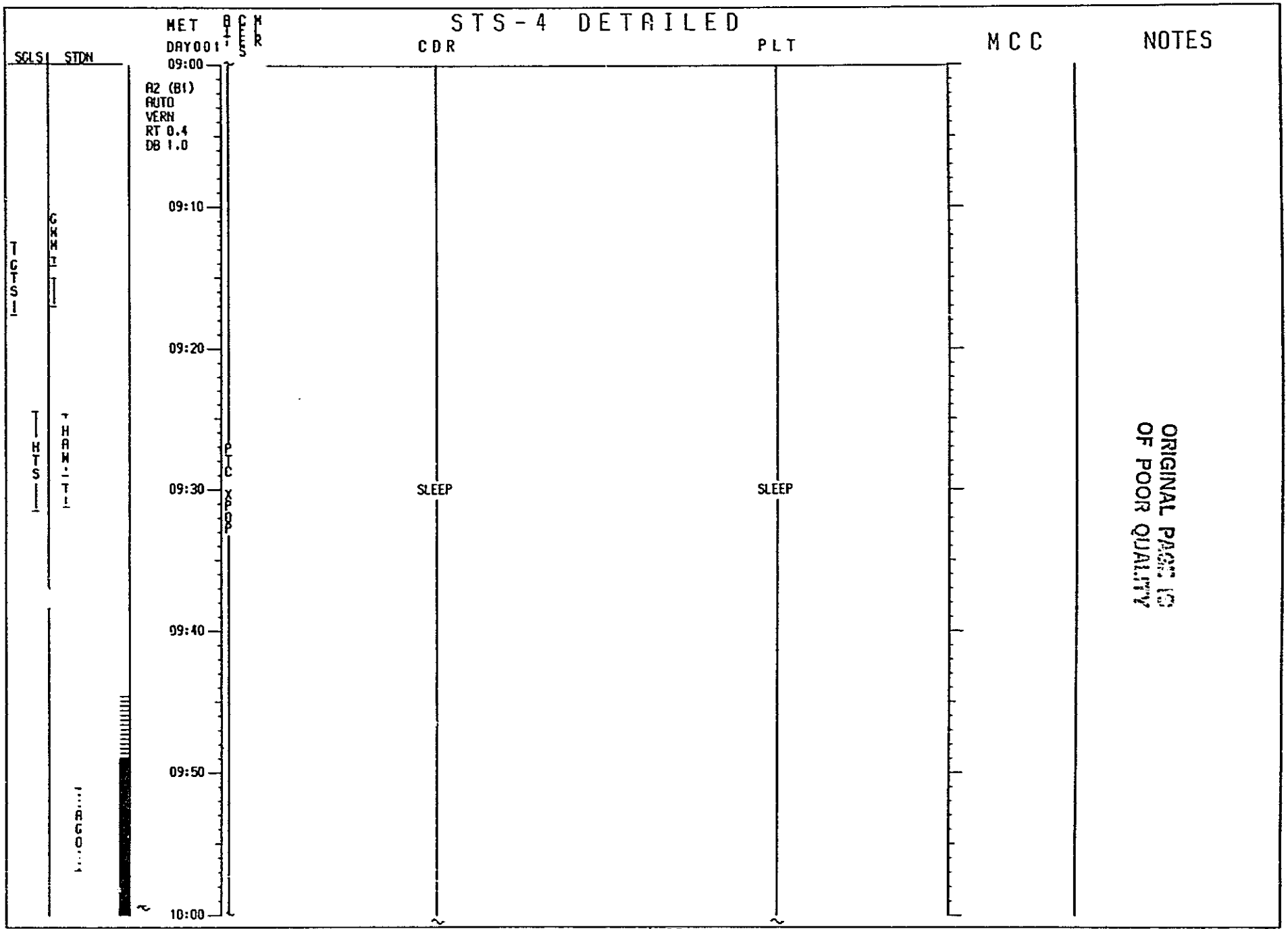
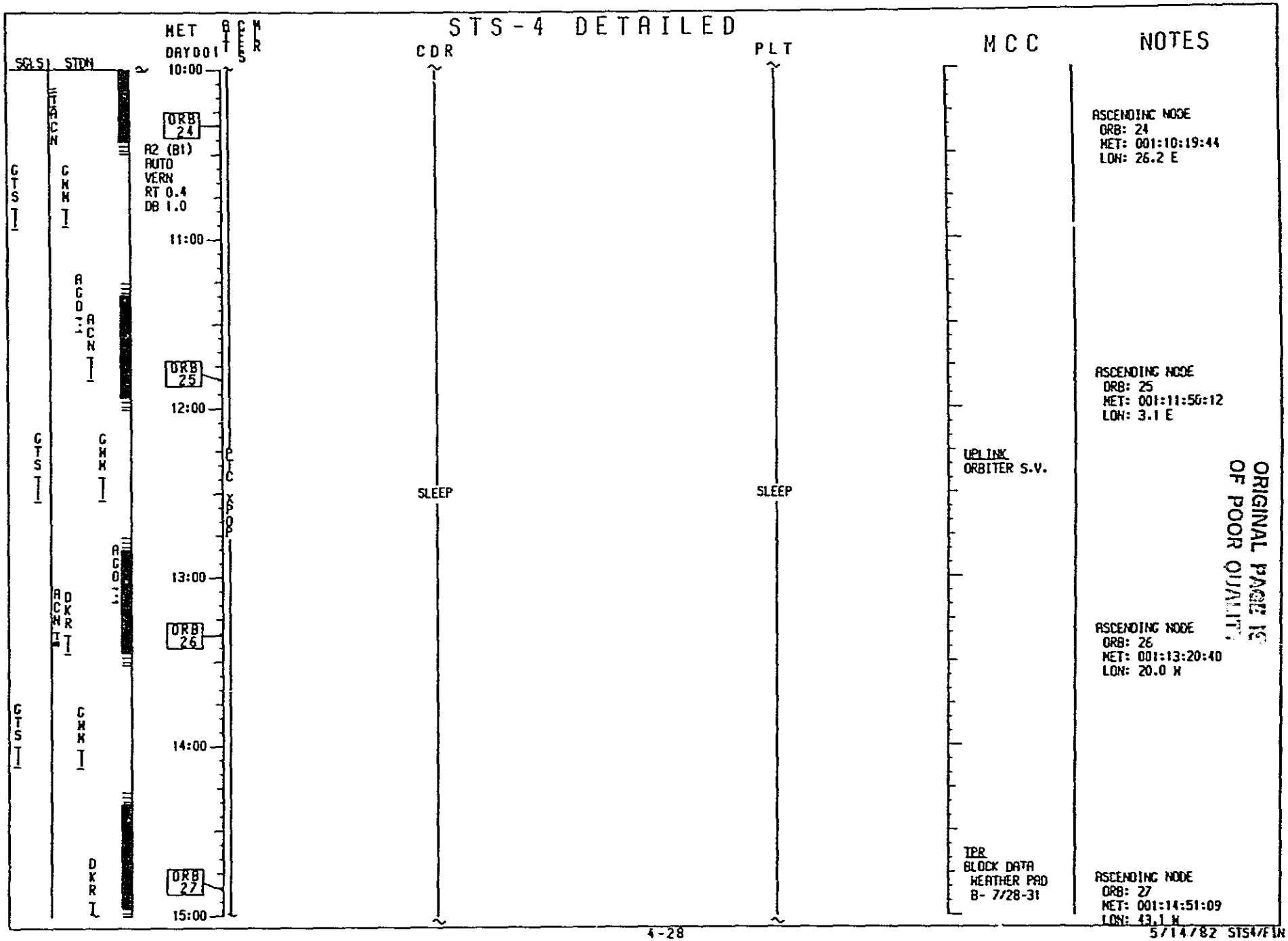
5/14/82 STS4/FIN



5714782 STS4/F1N

STS-4 DETAILED



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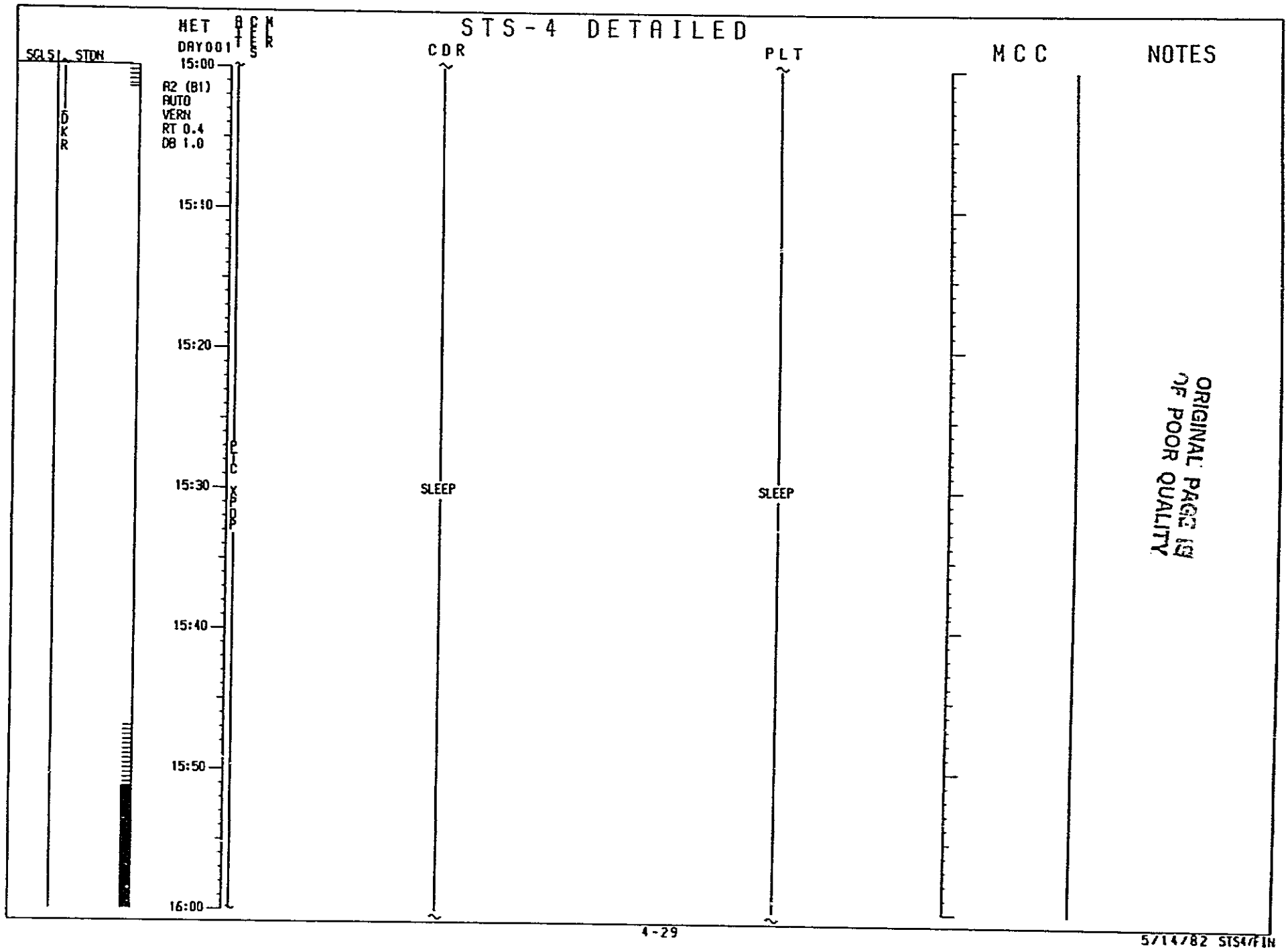
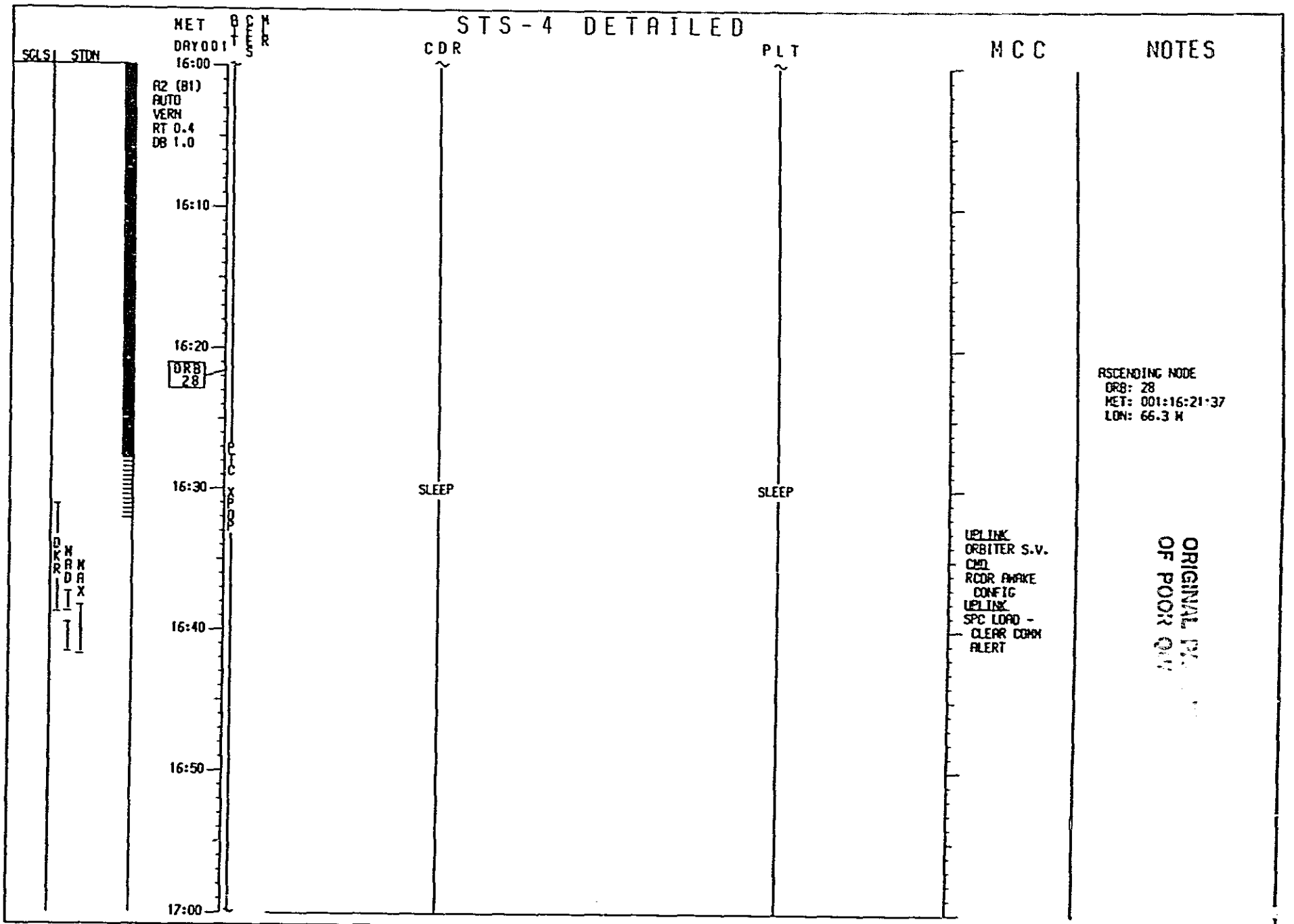

STS-4 DETAILED
MET
DAY 001
15:00
15:10
15:20
15:30
15:40
15:50
16:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
SGLS
STDN
DKR
ATS
CCSS
MLR
PLC
XSDP
CDR
PLT
MCC
NOTES
SLEEP
SLEEP
ORIGINAL PAGE IS
OF POOR QUALITY
4-29
5/14/82 STS4FIN

FLT DAY 3



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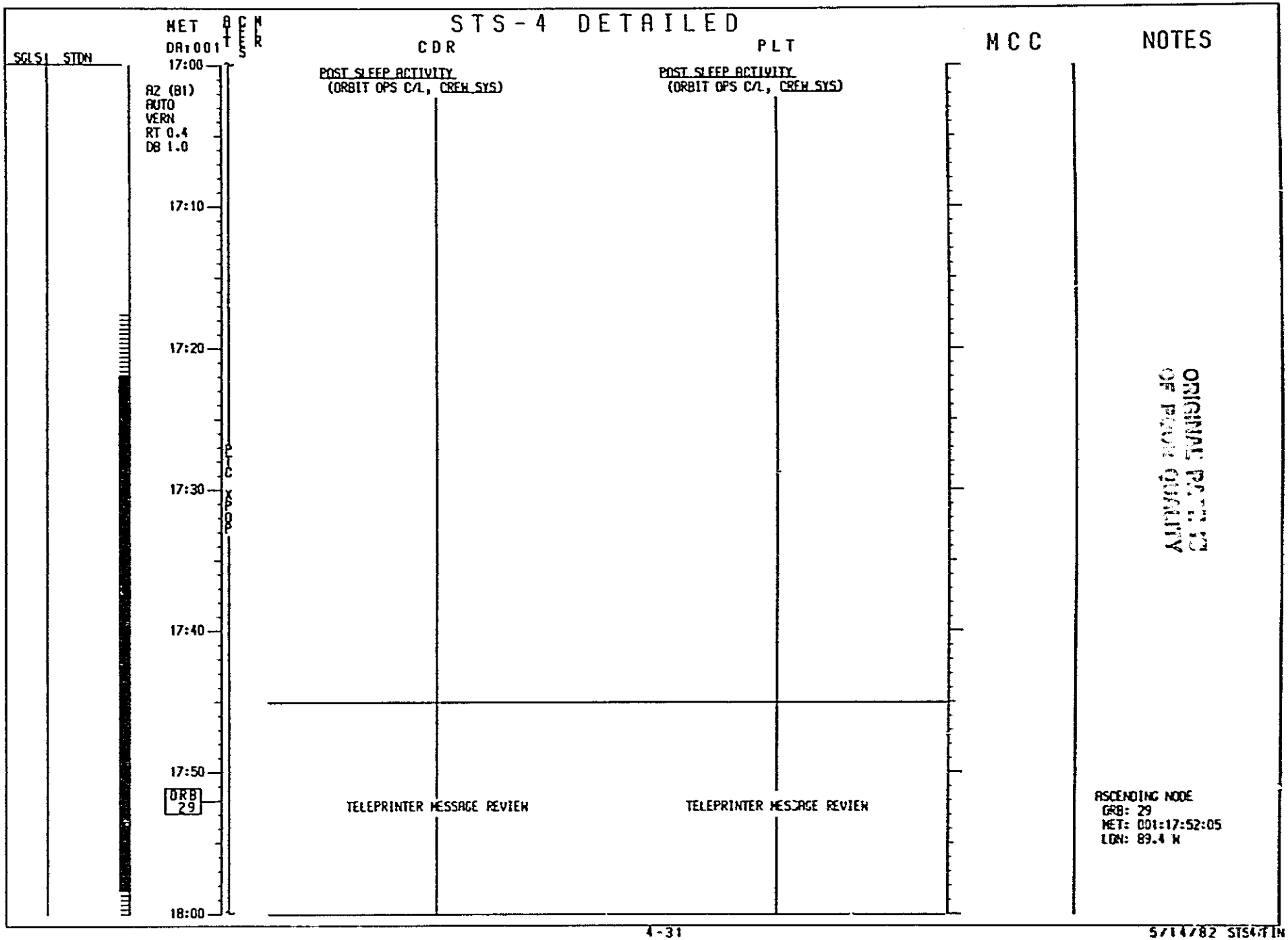
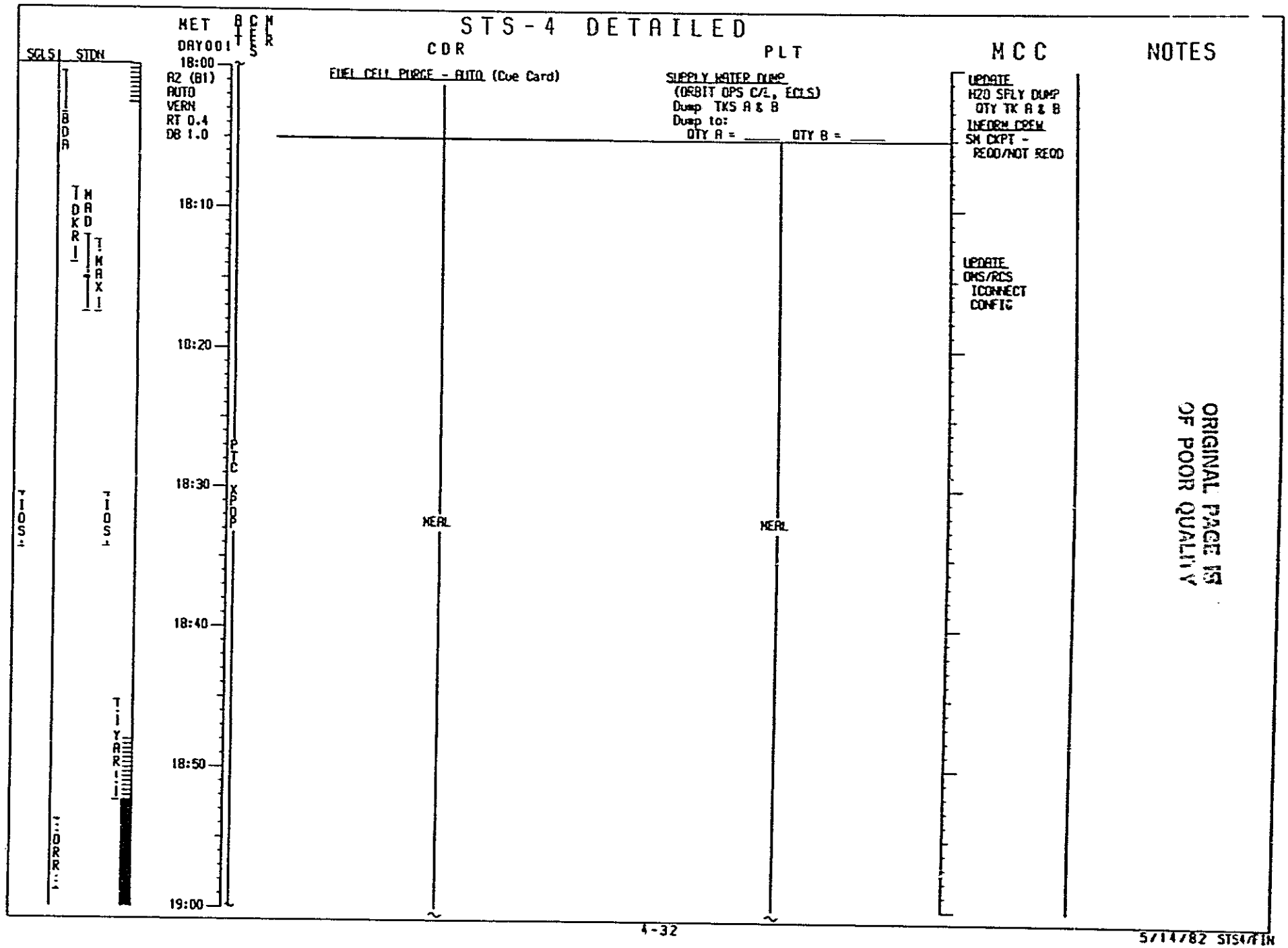

STS-4 DETAILED
MET
DA:001
ATTS
MNVR
SGLS
STDN
CDR
PLT
MCC
NOTES
17:00
17:10
17:20
17:30
17:40
17:50
18:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
TELEPRINTER MESSAGE REVIEW
TELEPRINTER MESSAGE REVIEW
ORB 29
ASCENDING NODE
ORB: 29
MET: 001:17:52:05
LON: 89.4 W
ALLIVUD AOOA 9E
ORIGINAL PAGE IS



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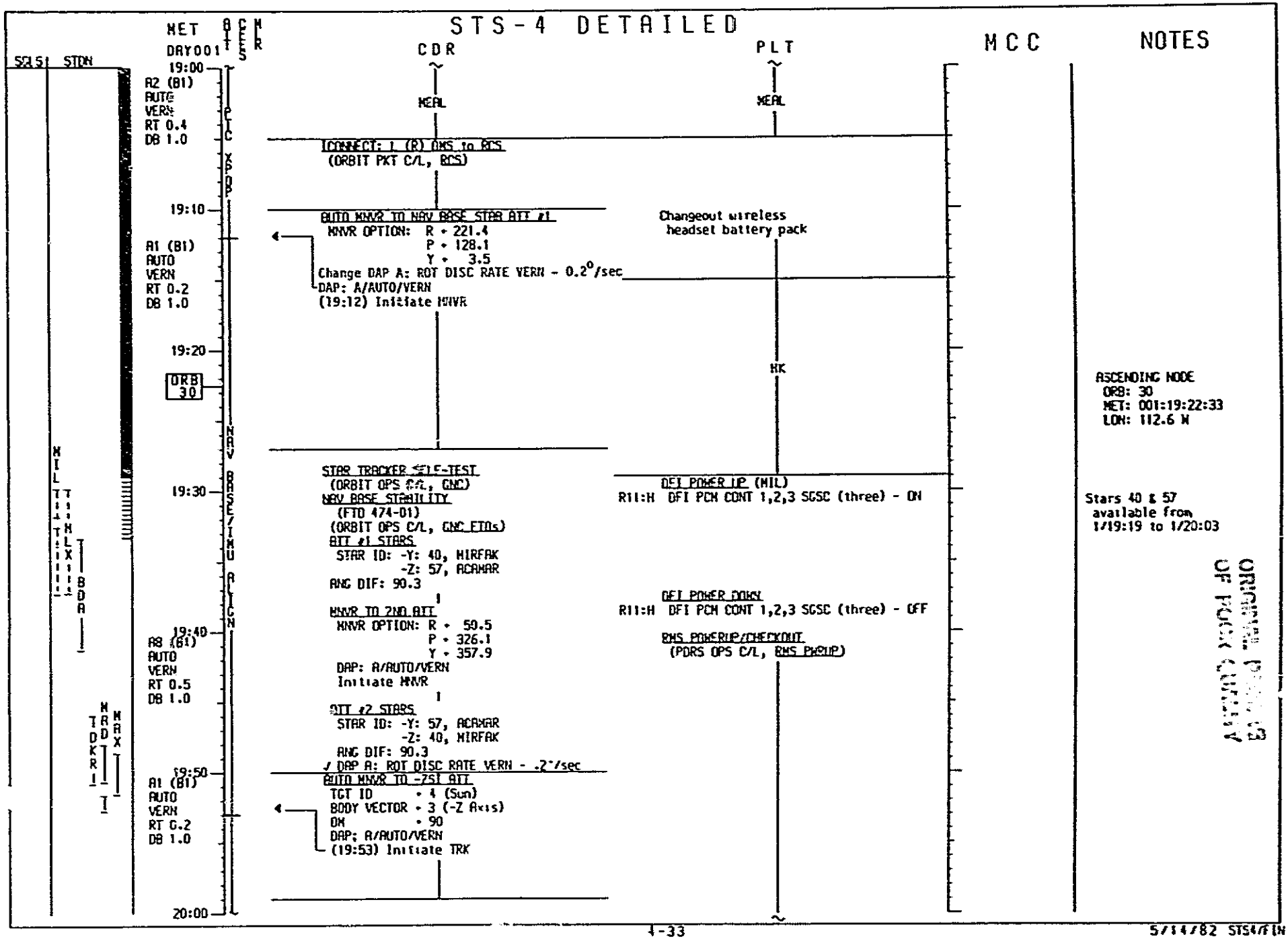
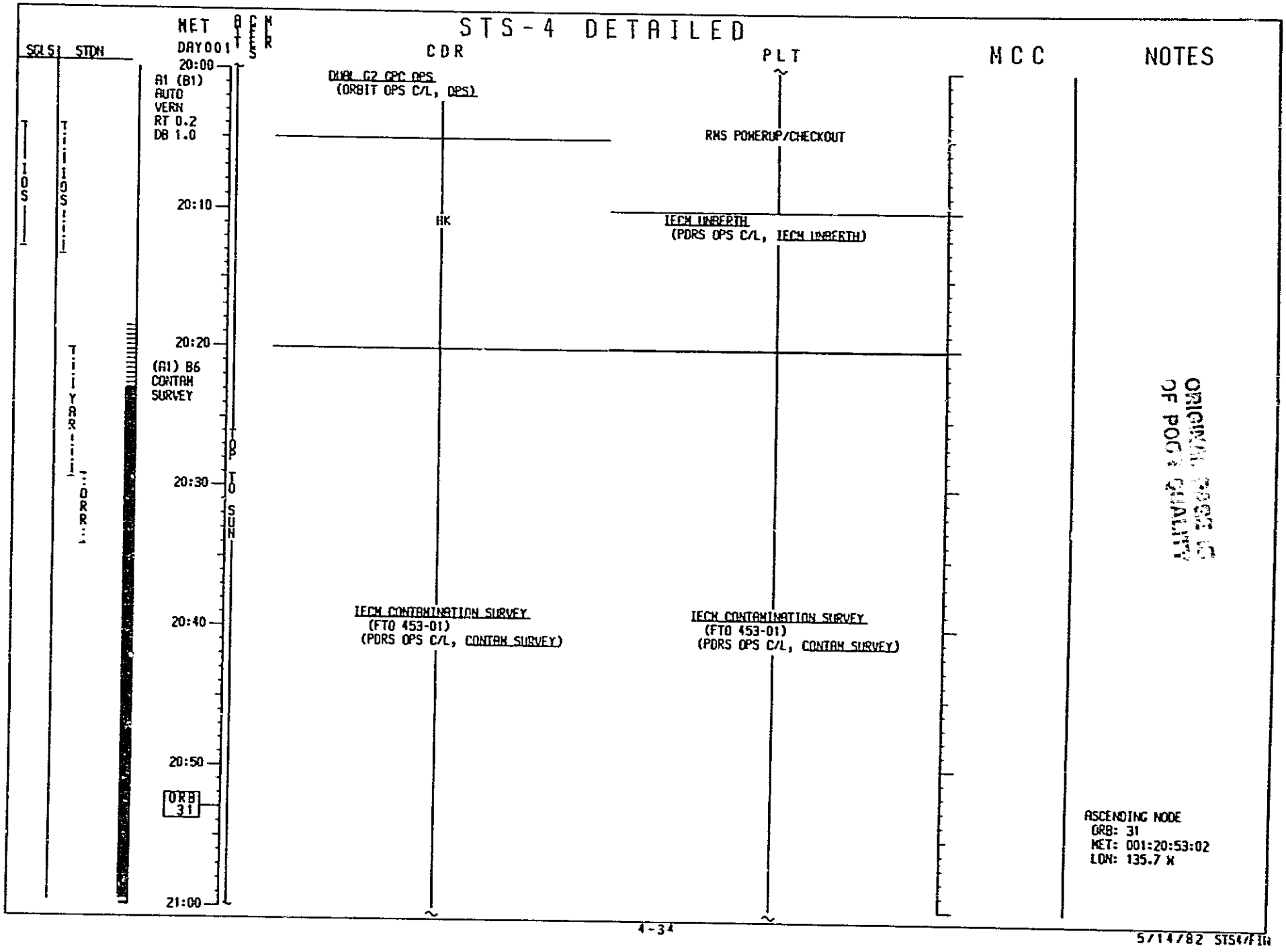
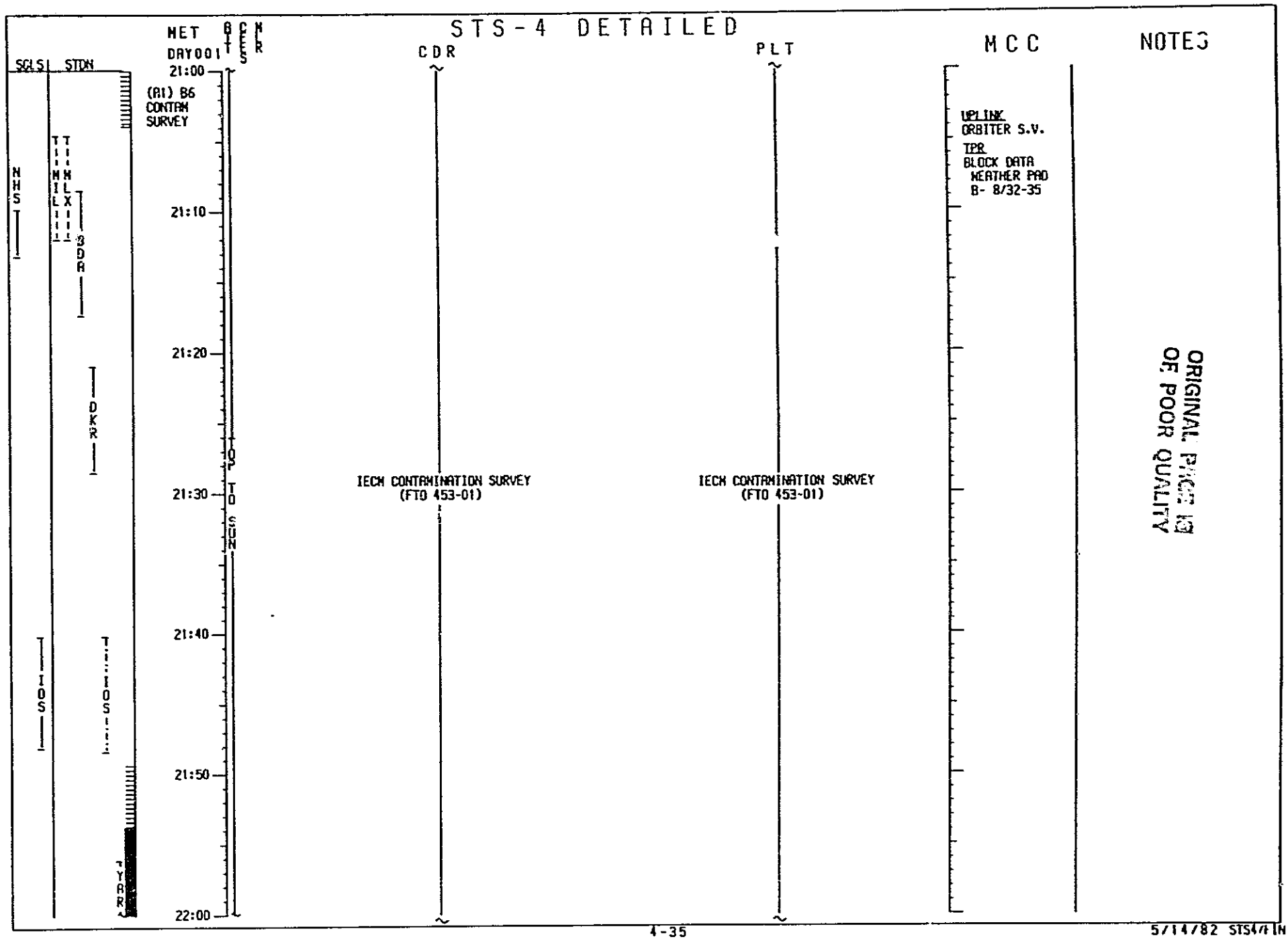
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY001
ACCESS
MK
SRSS
STDN
CDR
PLT
MCC
NOTES
MEAL
MEAL
19:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
PTC
XPOP
CONNECT: 1 (R) OMS to RCS
(ORBIT PKT C/L, RCS)
19:10
AUTO MNVR TO NAV BASE STAR ATT #1
MNVR OPTION: R = 221.4
P = 128.1
Y = 3.5
Changeout wireless
headset battery pack
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
Change DAP A: ROT DISC RATE VERN - 0.2°/sec
DAP: A/AUTO/VERN
(19:12) Initiate MNVR
19:20
ORB
30
HK
ASCENDING NODE
ORB: 30
MET: 001:19:22:33
LON: 112.6 W
NAV BASE/INU ALIGN
STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
NAV BASE STABILITY
(FTO 474-01)
(ORBIT OPS C/L, GNC FTOs)
ATT #1 STARS
STAR ID: -Y: 40, MIRFAK
-Z: 57, ACAMAR
ANG DIF: 90.3
19:30
DFI POWER UP (MIL)
R11:H DFI PCM CONT 1,2,3 SGSC (three) - ON
Stars 40 & 57
available from
1/19:19 to 1/20:03
MNVR TO 2ND ATT
MNVR OPTION: R = 50.5
P = 326.1
Y = 357.9
DAP: A/AUTO/VERN
Initiate MNVR
19:40
A8 (B1)
AUTO
VERN
RT 0.5
DB 1.0
ATT #2 STARS
STAR ID: -Y: 57, ACAMAR
-Z: 40, MIRFAK
ANG DIF: 90.3
DFI POWER DOWN
R11:H DFI PCM CONT 1,2,3 SGSC (three) - OFF
DAP A: ROT DISC RATE VERN - .2°/sec
AUTO MNVR TO -ZSI ATT
TGT ID = 4 (Sun)
BODY VECTOR = 3 (-Z Axis)
OM = 90
DAP: A/AUTO/VERN
(19:53) Initiate TRK
RMS POWERUP/CHECKOUT
(PDRS OPS C/L, RMS PWRUP)
19:50
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
20:00
MILA
TILA
TDRS
MAX
BDA



5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY001
SGLS
STDN
NHS
TILS
TILX
3DR
DKR
IOS
TIOS
TYR
21:00
21:10
21:20
21:30
21:40
21:50
22:00
(R1) B6 CONTAM SURVEY
OPS TO SCN
ACCESS
SCNR
CDR
PLT
IECH CONTAMINATION SURVEY (FTO 453-01)
IECH CONTAMINATION SURVEY (FTO 453-01)
MCC
UPLINK
ORBITER S.V.
TPR
BLOCK DATA
WEATHER PAD
B- 8/32-35
NOTES
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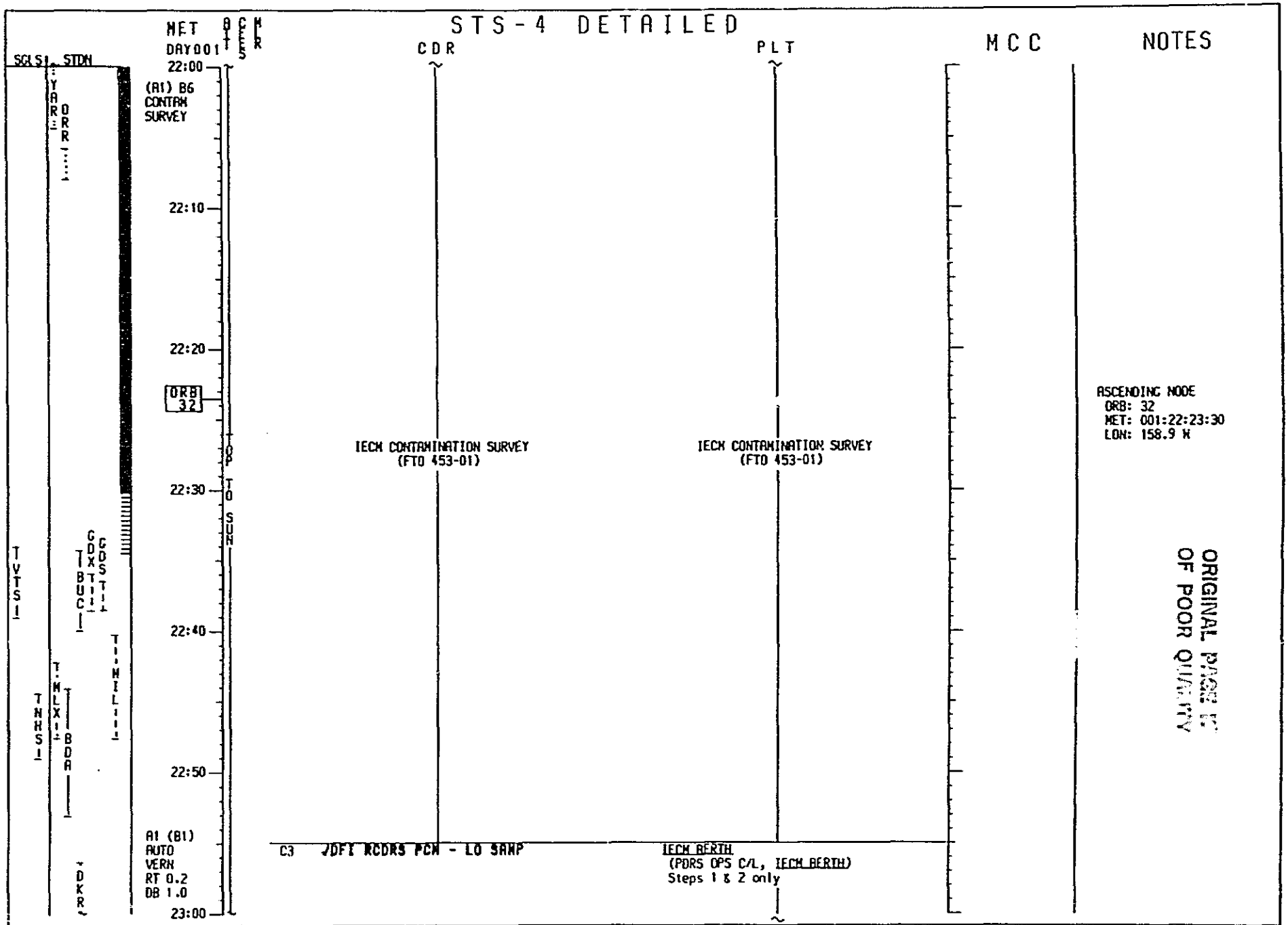
STS-4 DETAILED



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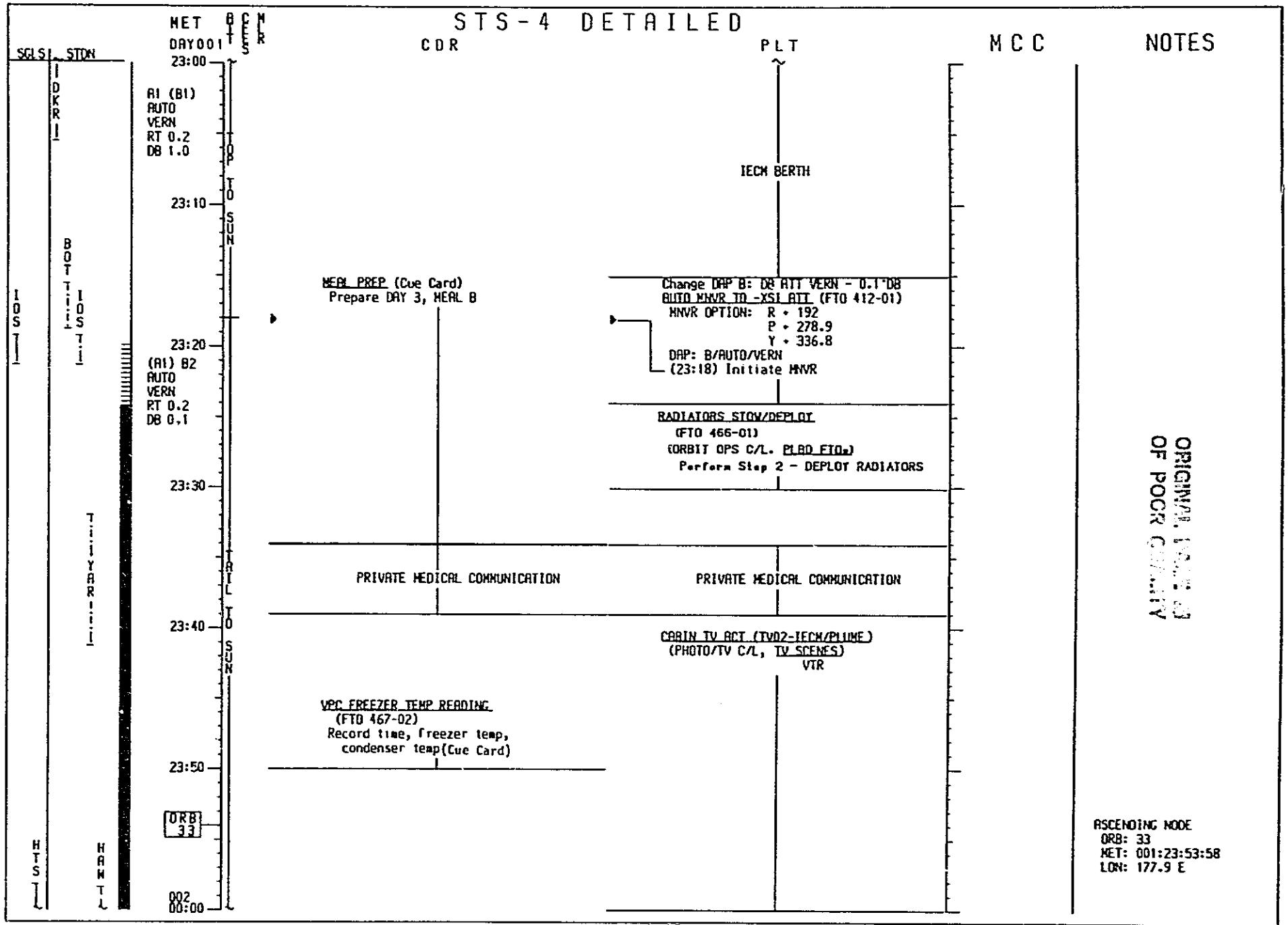
STS-4 DETAILED



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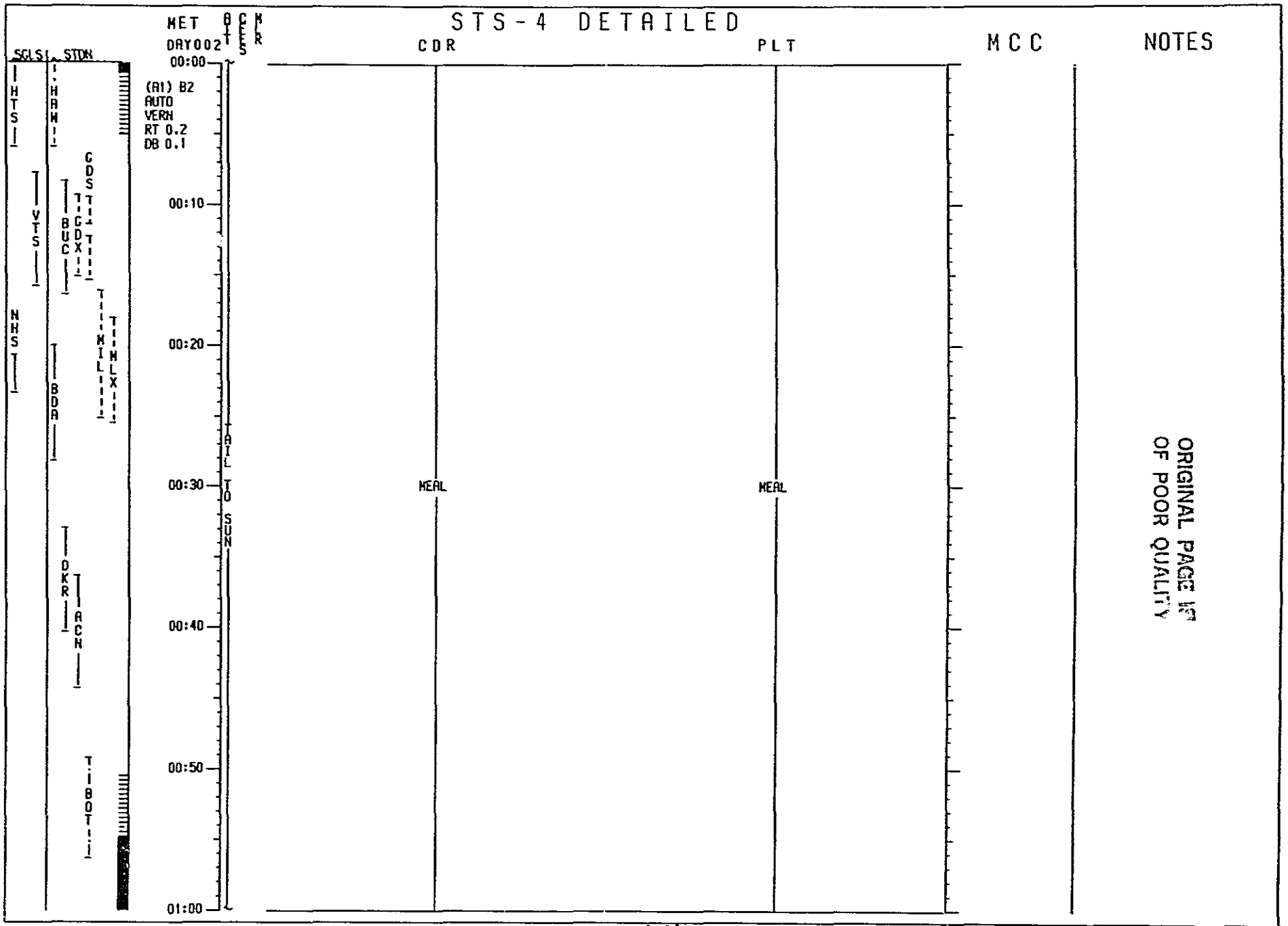
STS-4 DETAILED
MET
DAY002
SGLS
STDN
HTS
VTS
HHS
I-HAW
BUC
GDX
GDS TIA TIS
BDA
TIL
TIMIL
TIMLX
DKR
ACN
TIBOT
00:00
00:10
00:20
00:30
00:40
00:50
01:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
AOS
MRS
AIL TO SUN
CDR
PLT
MCC
NOTES
MEAL
MEAL
ORIGINAL PAGE IS
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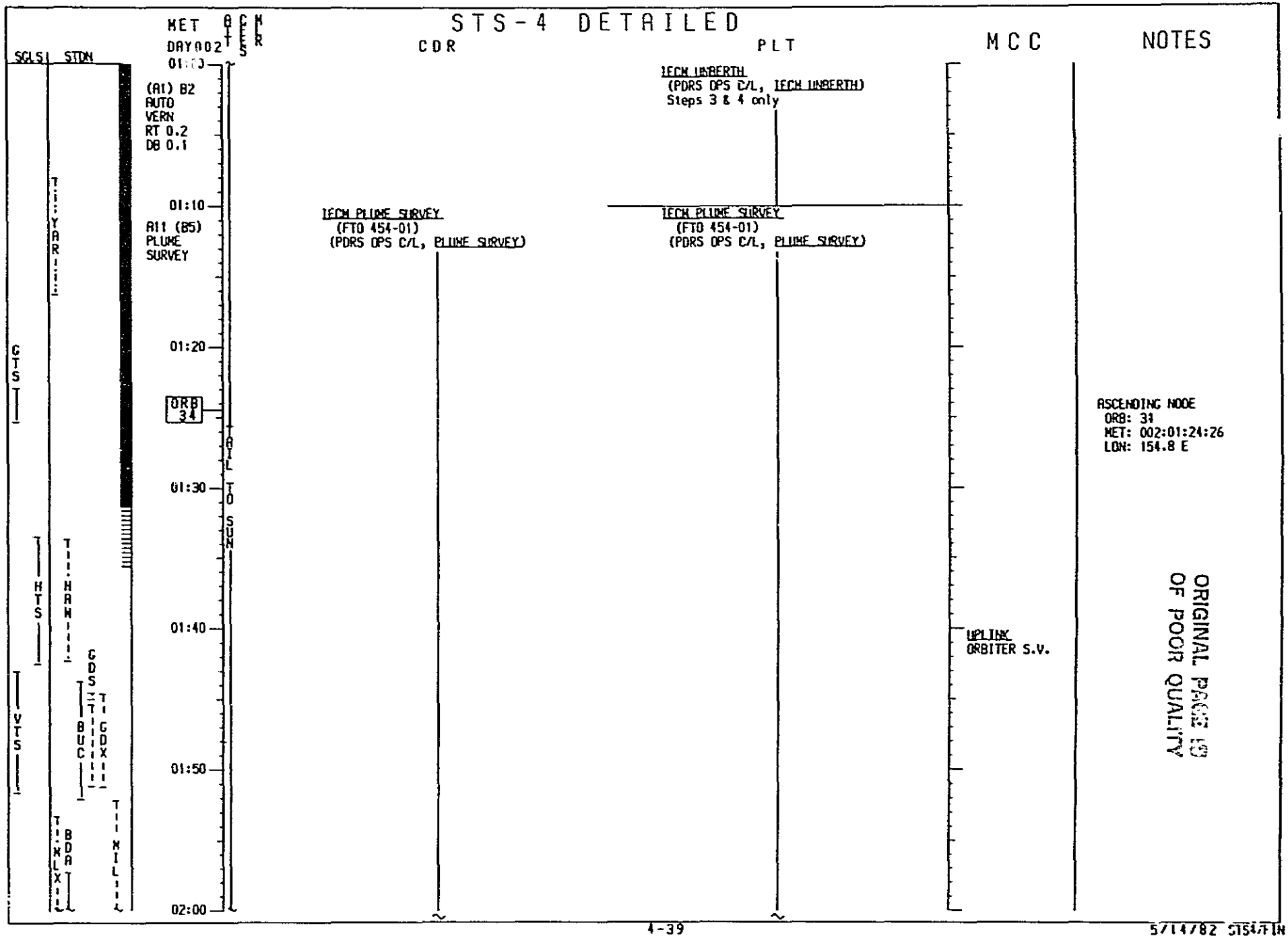

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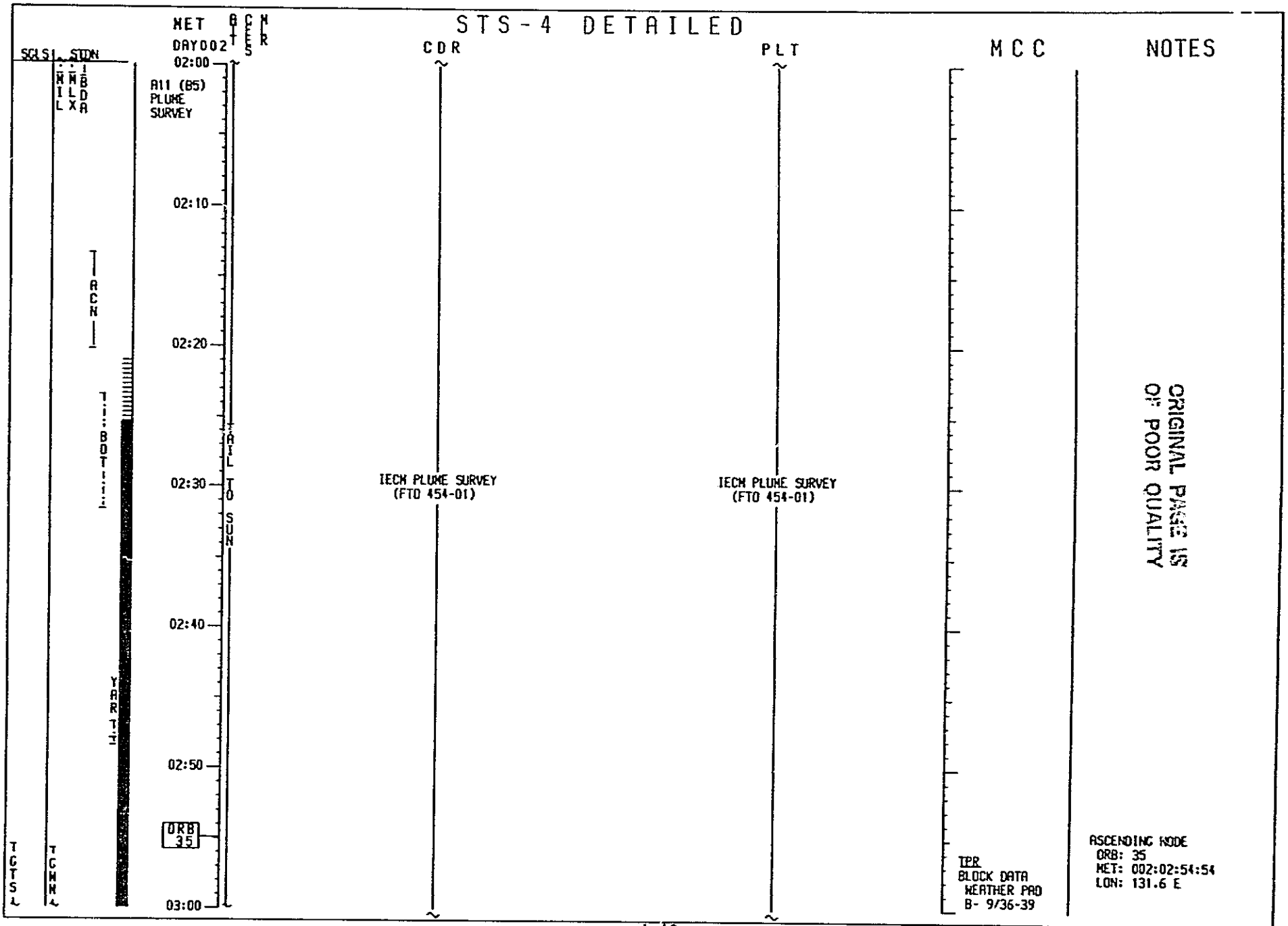
5/14/82 STS4-FIN



5/14/82 STS4/FIN

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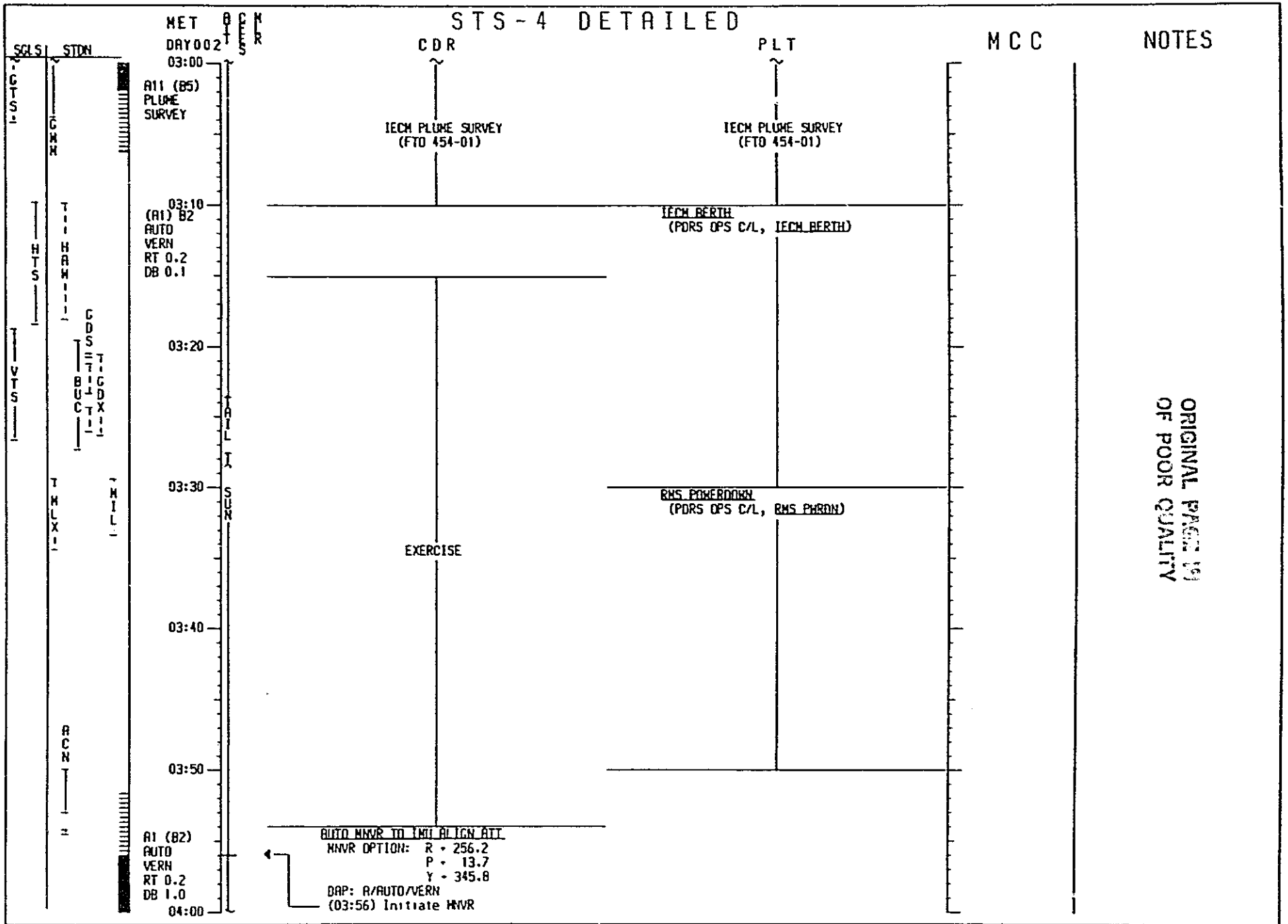

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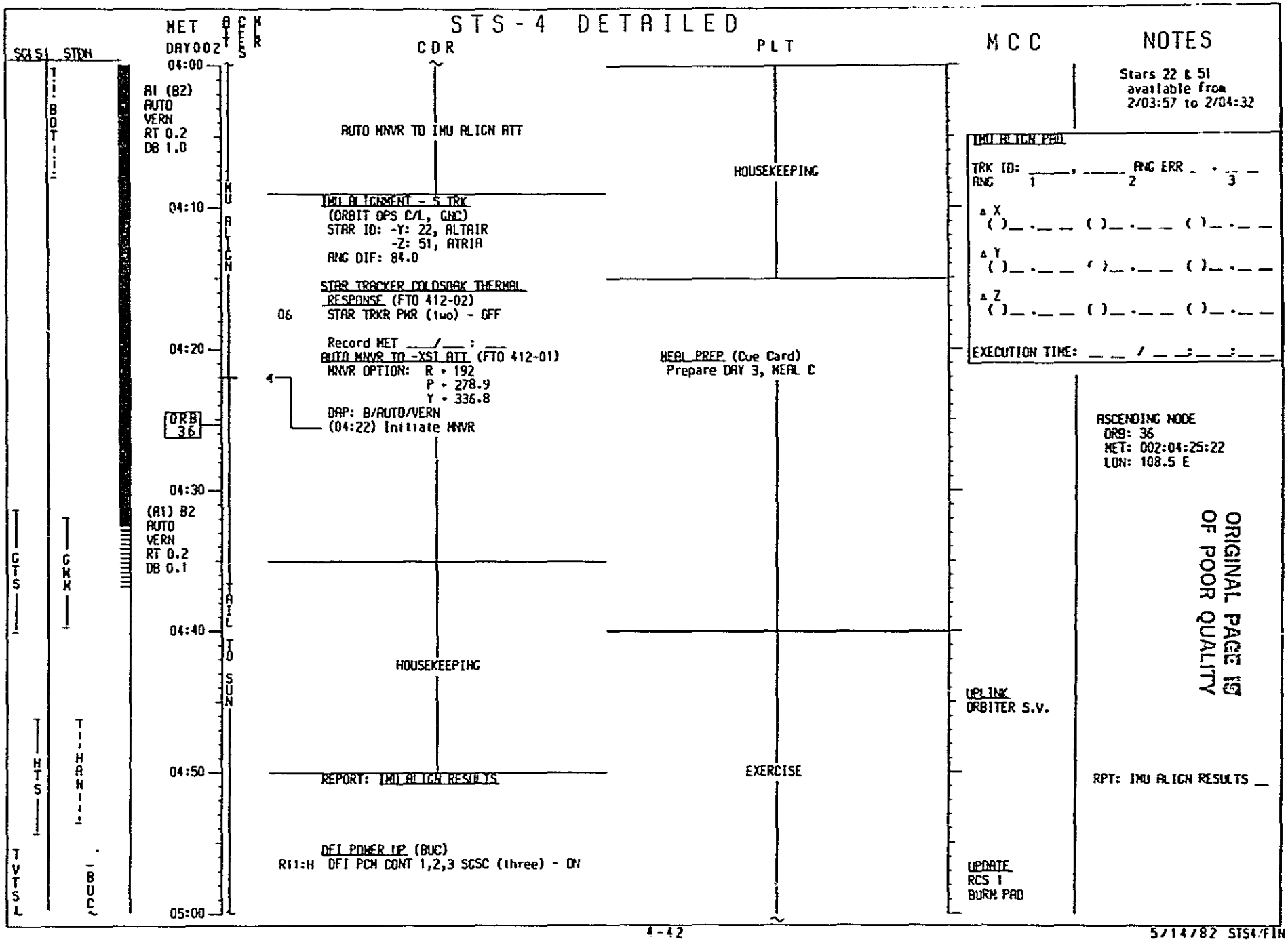

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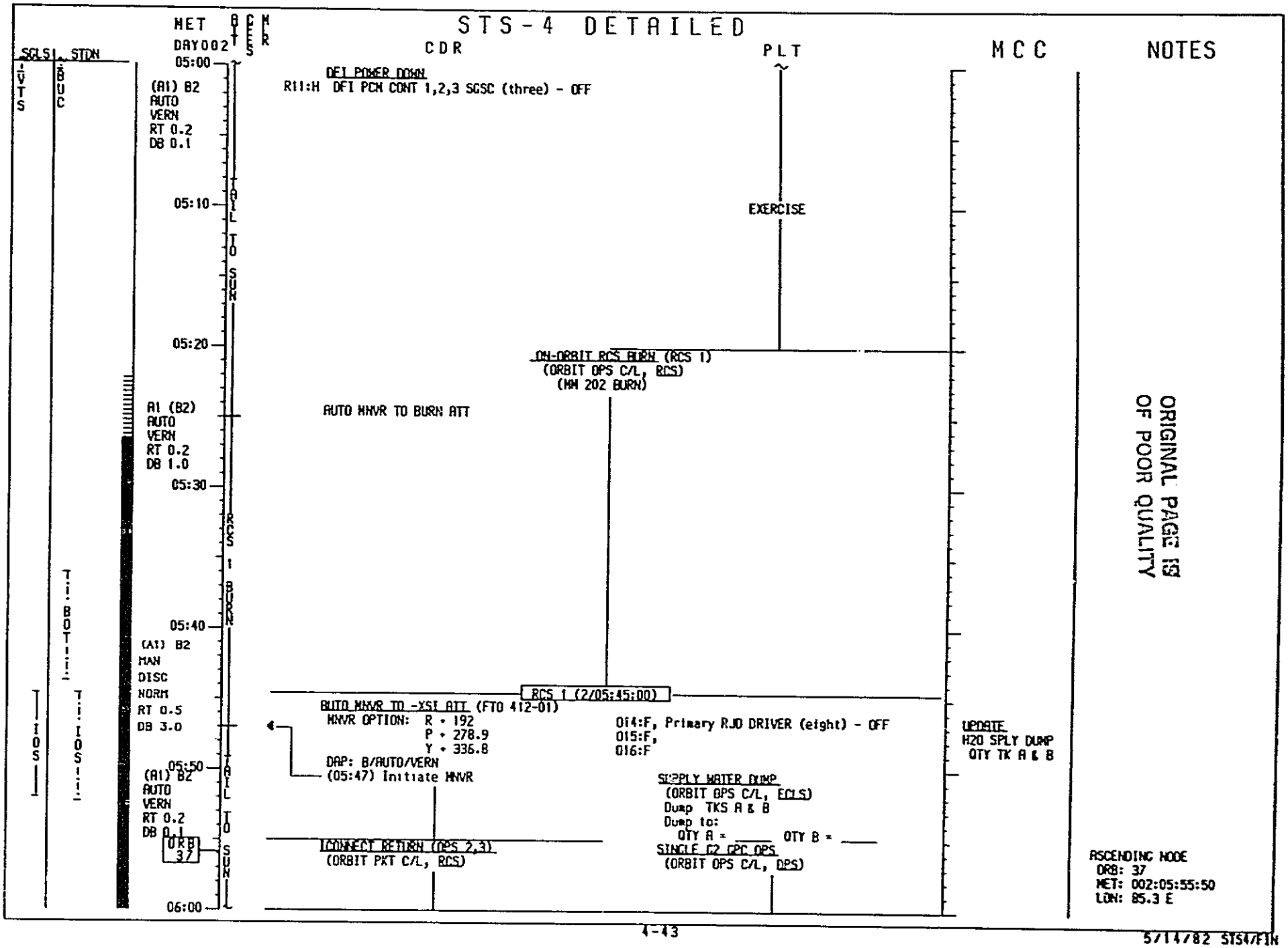
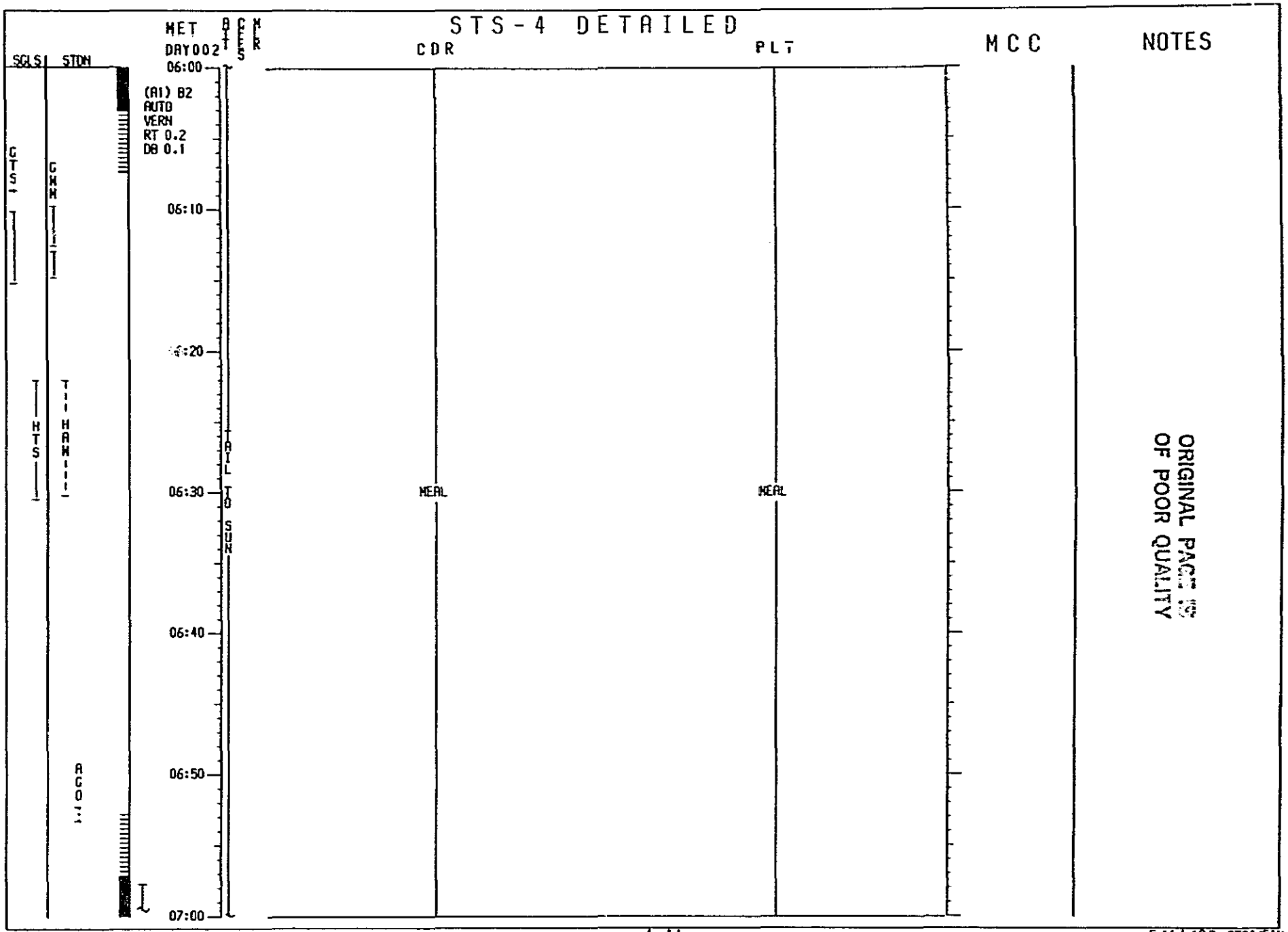
STS-4 DETAILED



5/14/82 STS4/FIN



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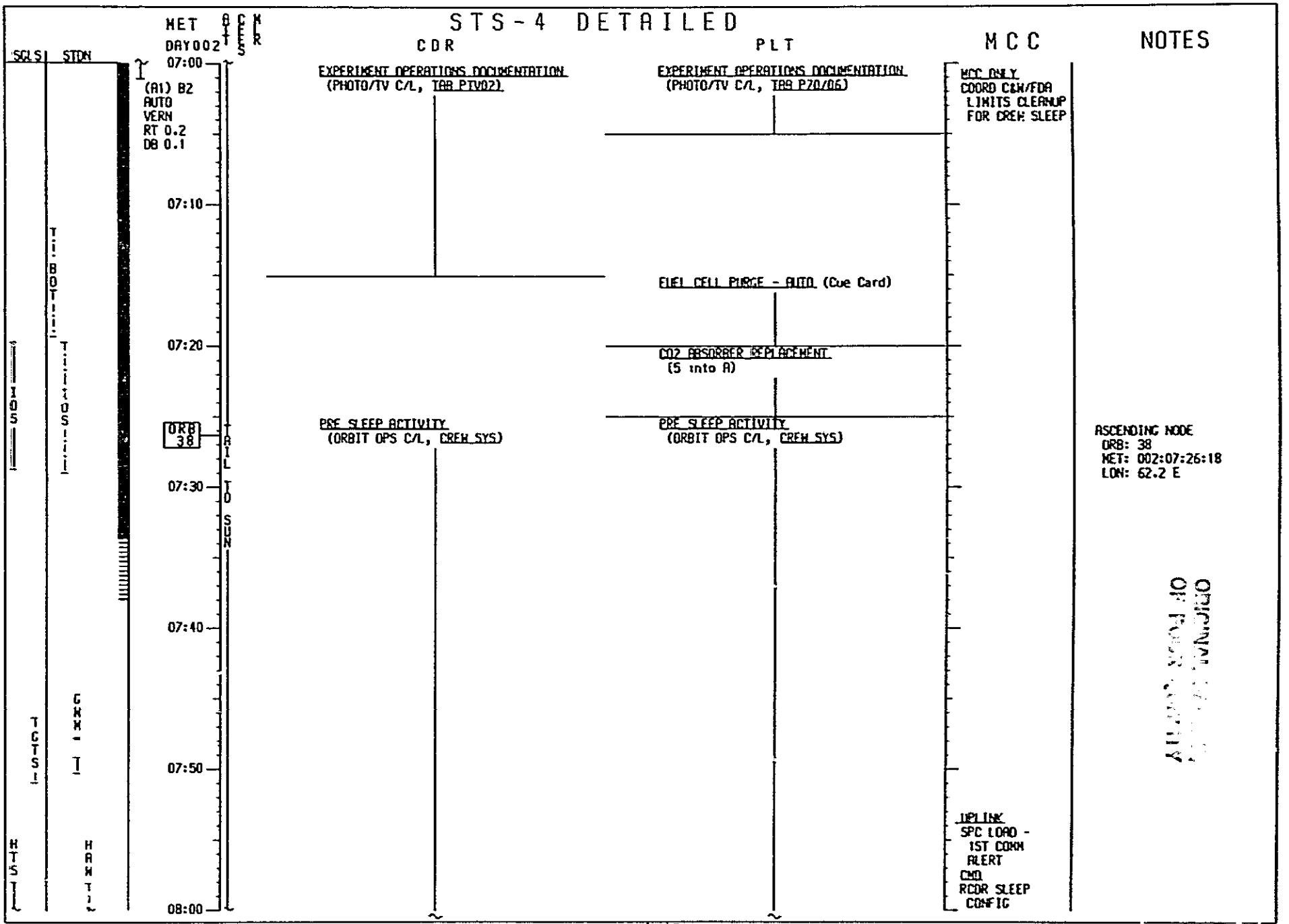
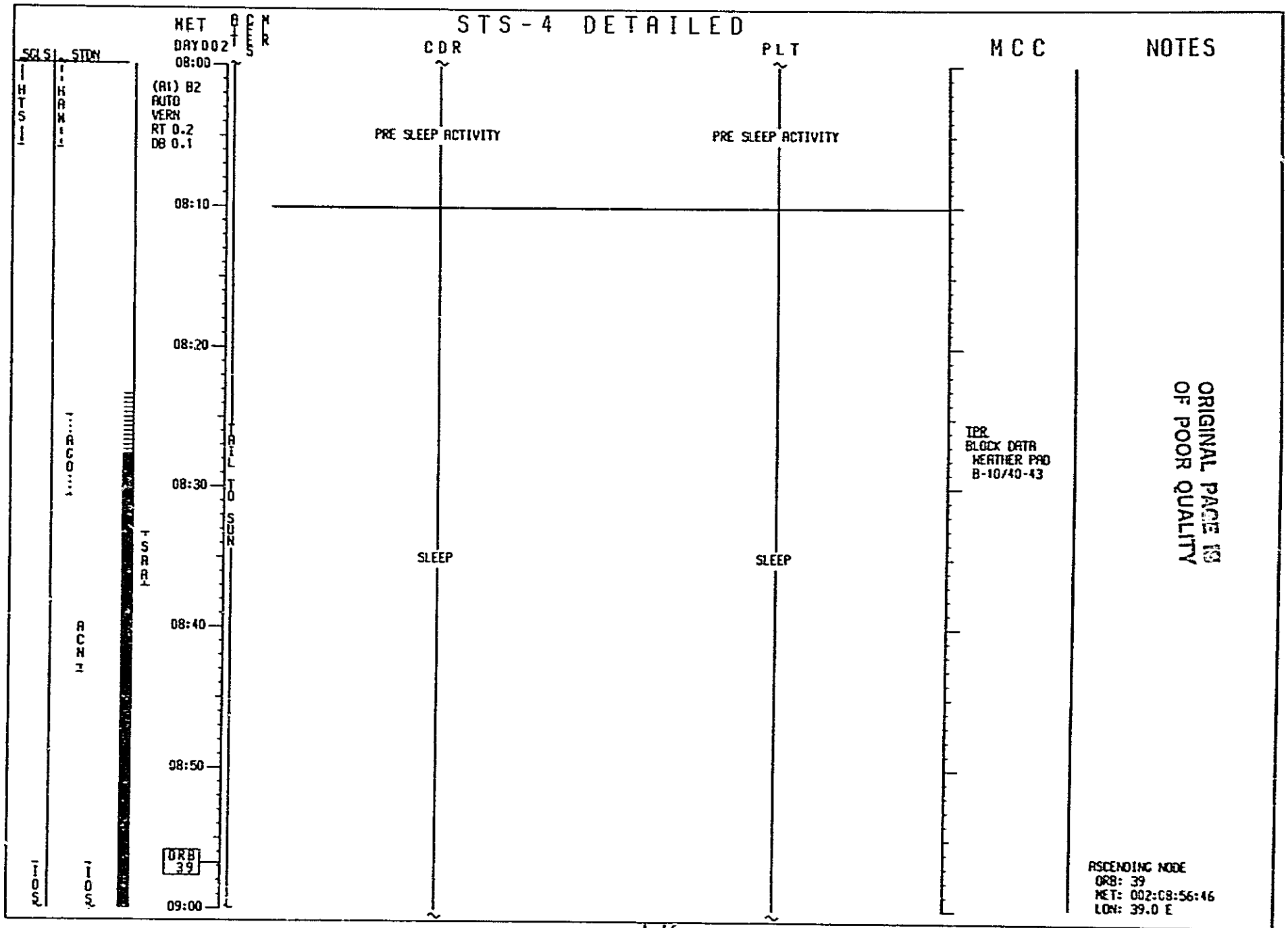
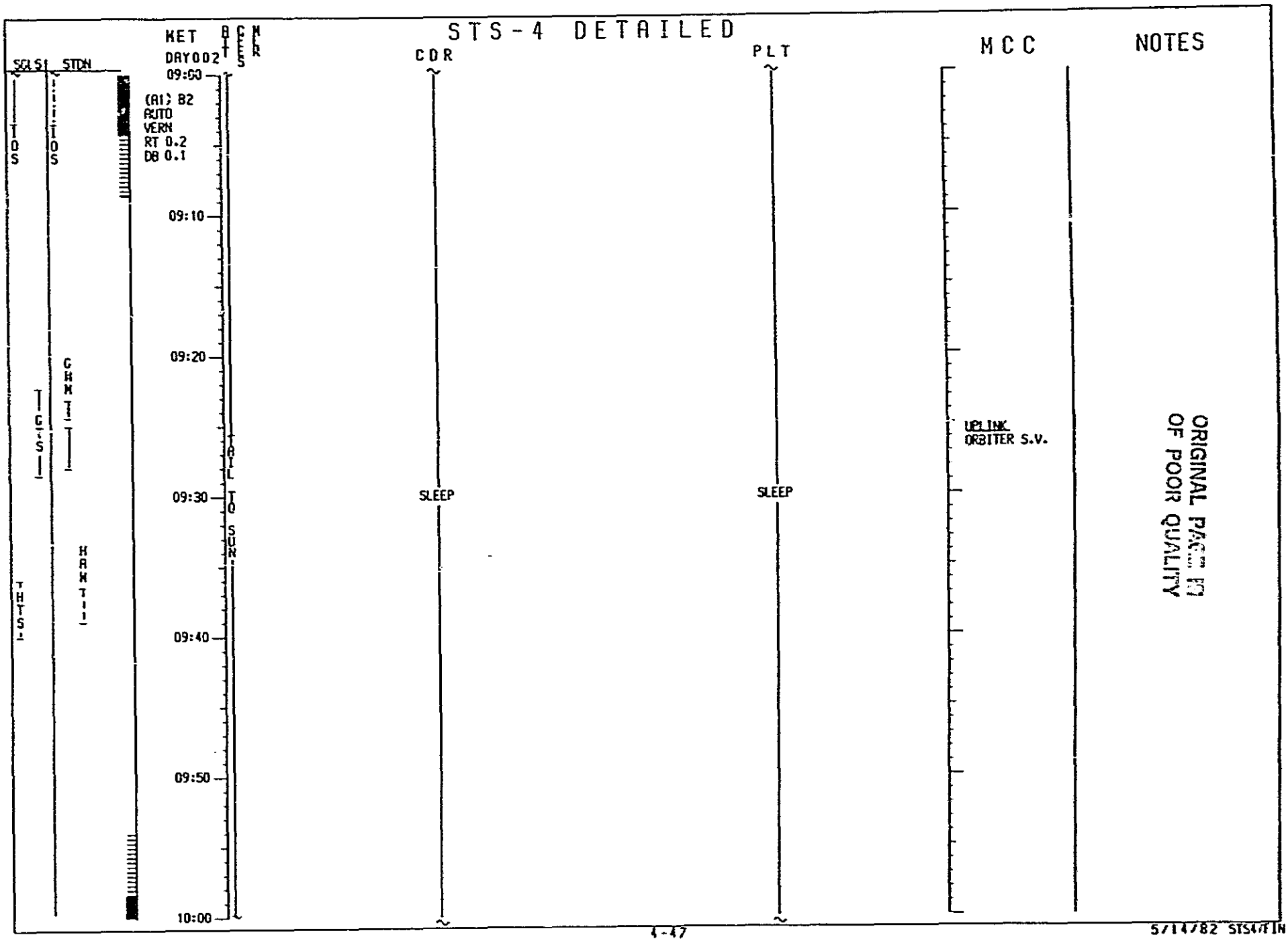
STS-4 DETAILED



5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 002
08:00
08:10
08:20
08:30
08:40
08:50
09:00
ORB 39
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ACCESS
AOS TO SGN
SGLS
STDN
HTSI
THAM
ACN1
TSRA
TDRS
CDR
PLT
PRE SLEEP ACTIVITY
PRE SLEEP ACTIVITY
SLEEP
SLEEP
MCC
TER
BLOCK DATA
WEATHER PAD
B-10/40-43
NOTES
ASCENDING NODE
ORB: 39
MET: 002:08:56:46
LON: 39.0 E
ORIGINAL PAGE IS
OF POOR QUALITY
4-45
5/14/82 STS4FIN


STS-4 DETAILED
MET
DAY 002
SGLS
STDN
TDRS
GHM TI
HAW TI
09:00
09:10
09:20
09:30
09:40
09:50
10:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ATL TO SUN
CDR
PLT
SLEEP
SLEEP
MCC
UPLINK
ORBITER S.V.
NOTES
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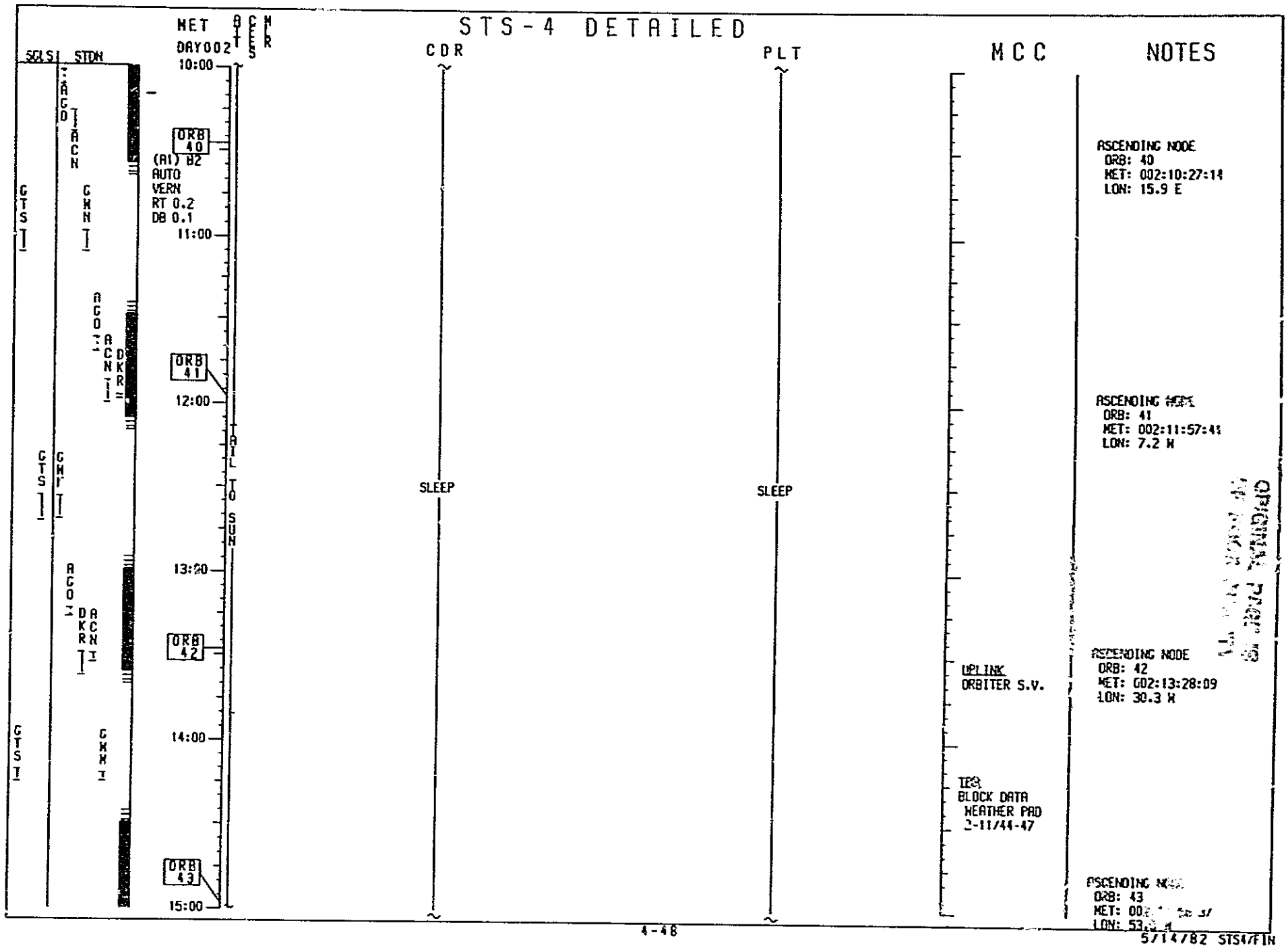
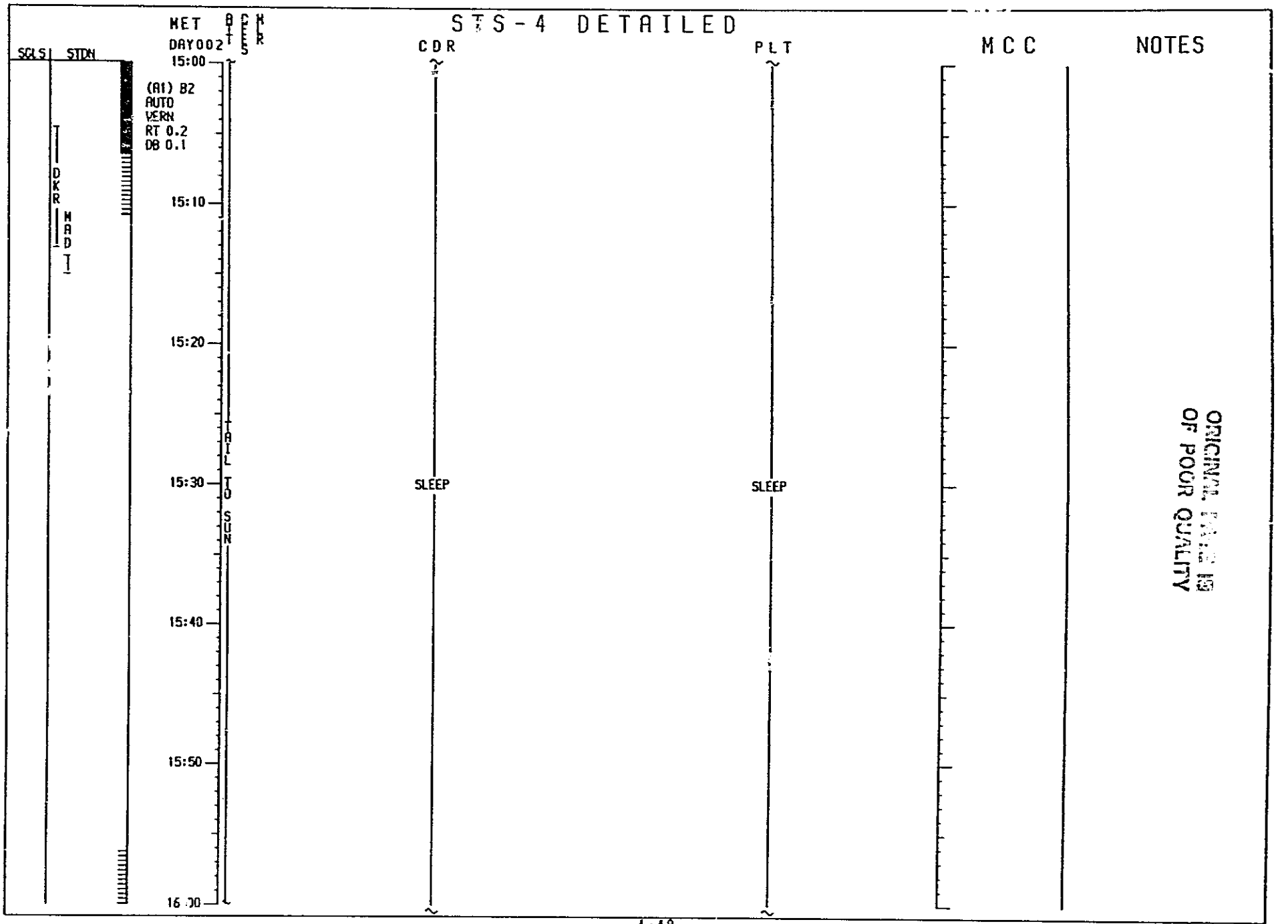
4-47
5/14/82 STS4FIN

STS-4 DETAILED



5/14/82 STS4FIN


STS-4 DETAILED
MET
DAY002
SGLS
STDN
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
DKR
MADI
15:00
15:10
15:20
15:30
15:40
15:50
16:00
TAIL TO SUN
CDR
PLT
SLEEP
SLEEP
MCC
NOTES
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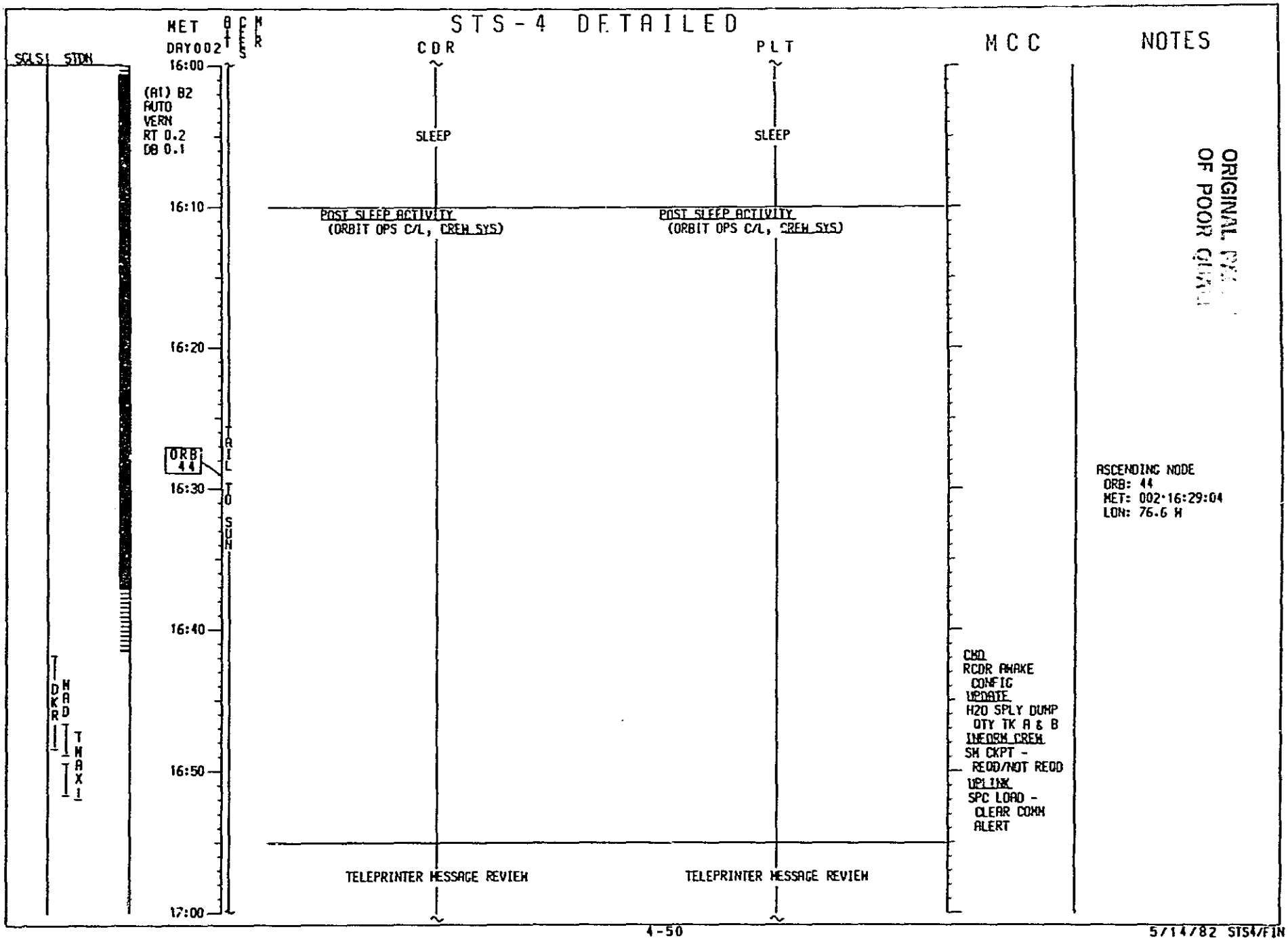
4-49
5/14/82 STS4/FIN

FLT DAY 4

STS-4 DETAILED



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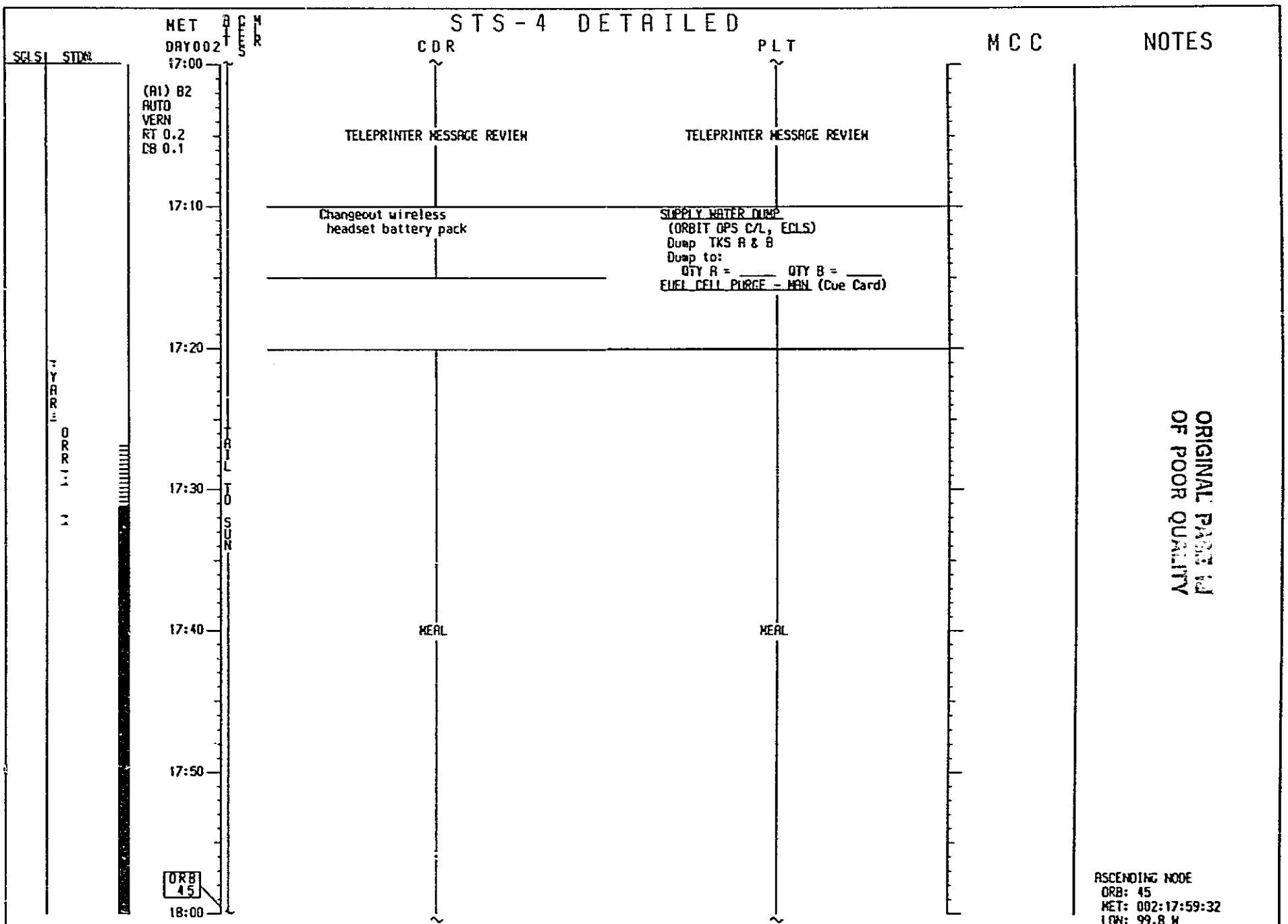

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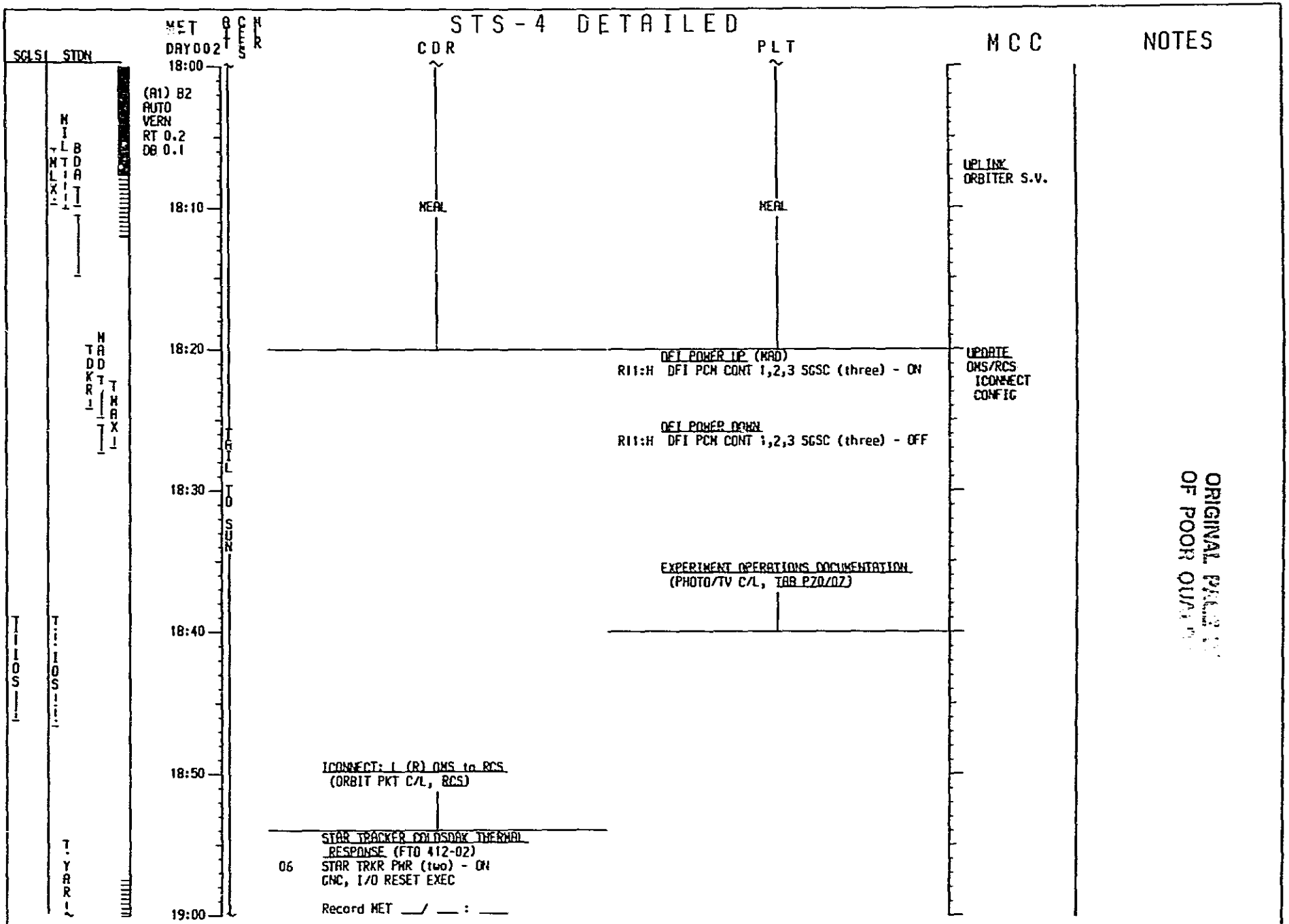
5/14/82 SISA/FIN



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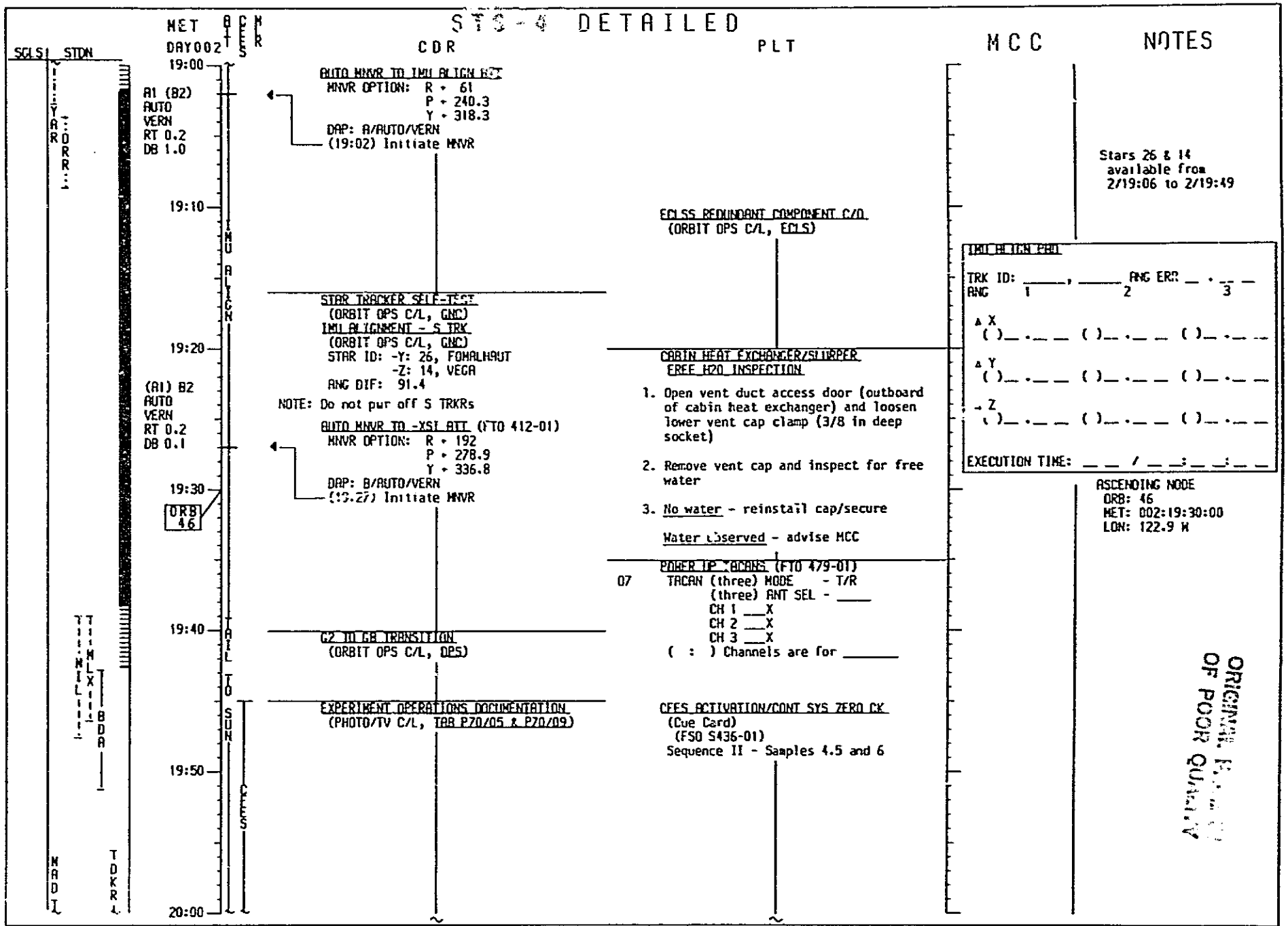
STS-4 DETAILED



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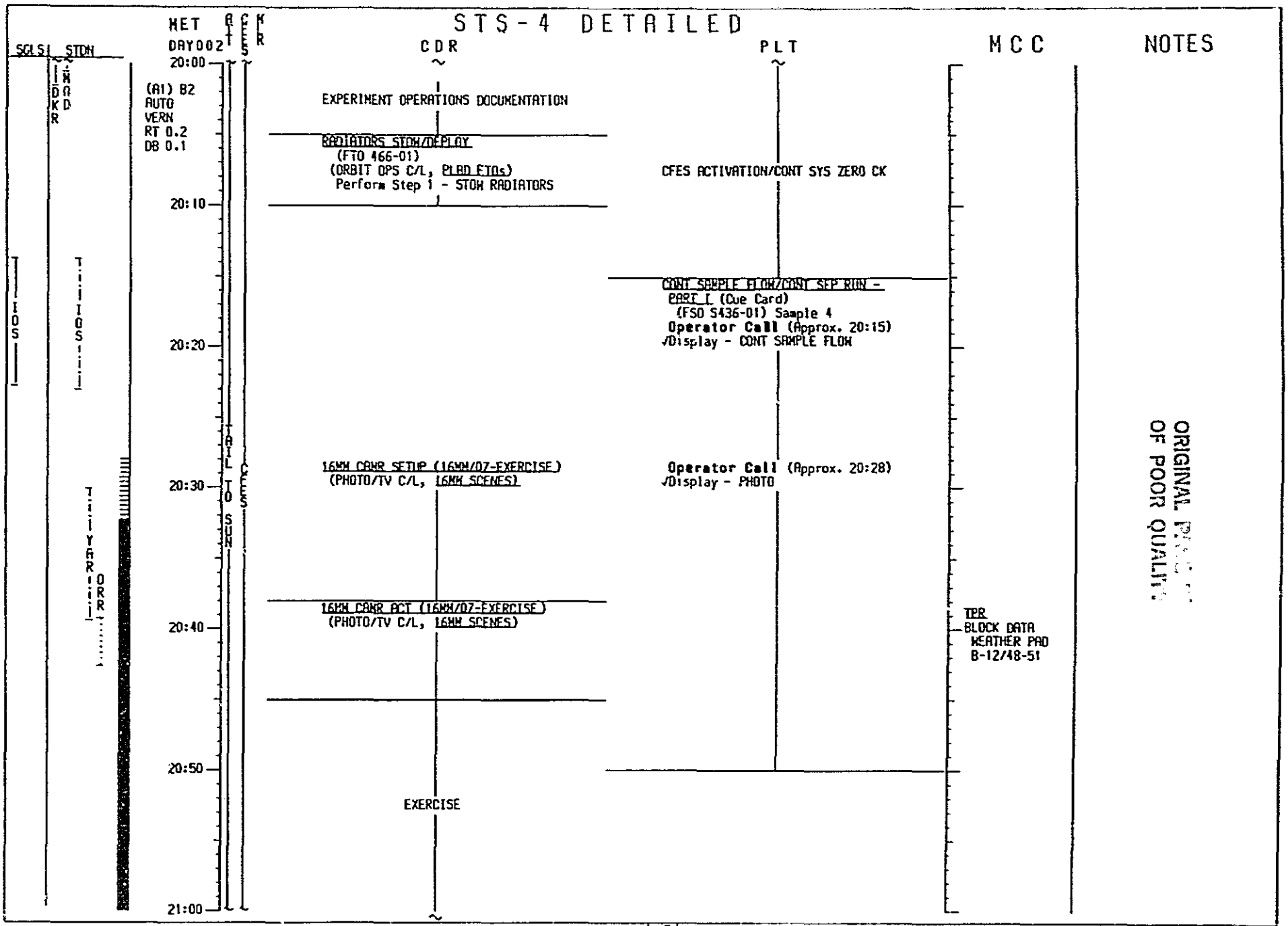

5/14/82 STS4/FIN

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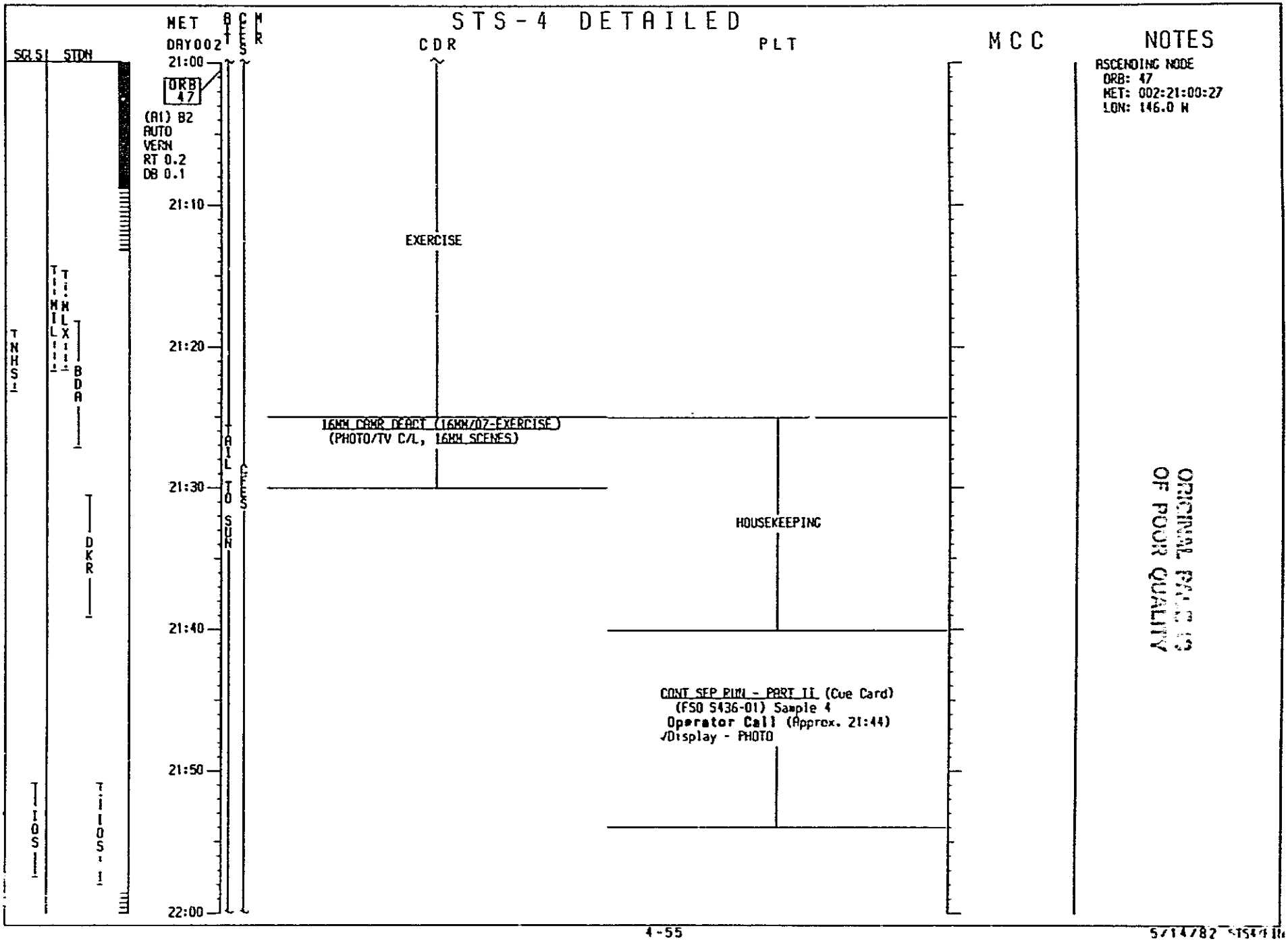

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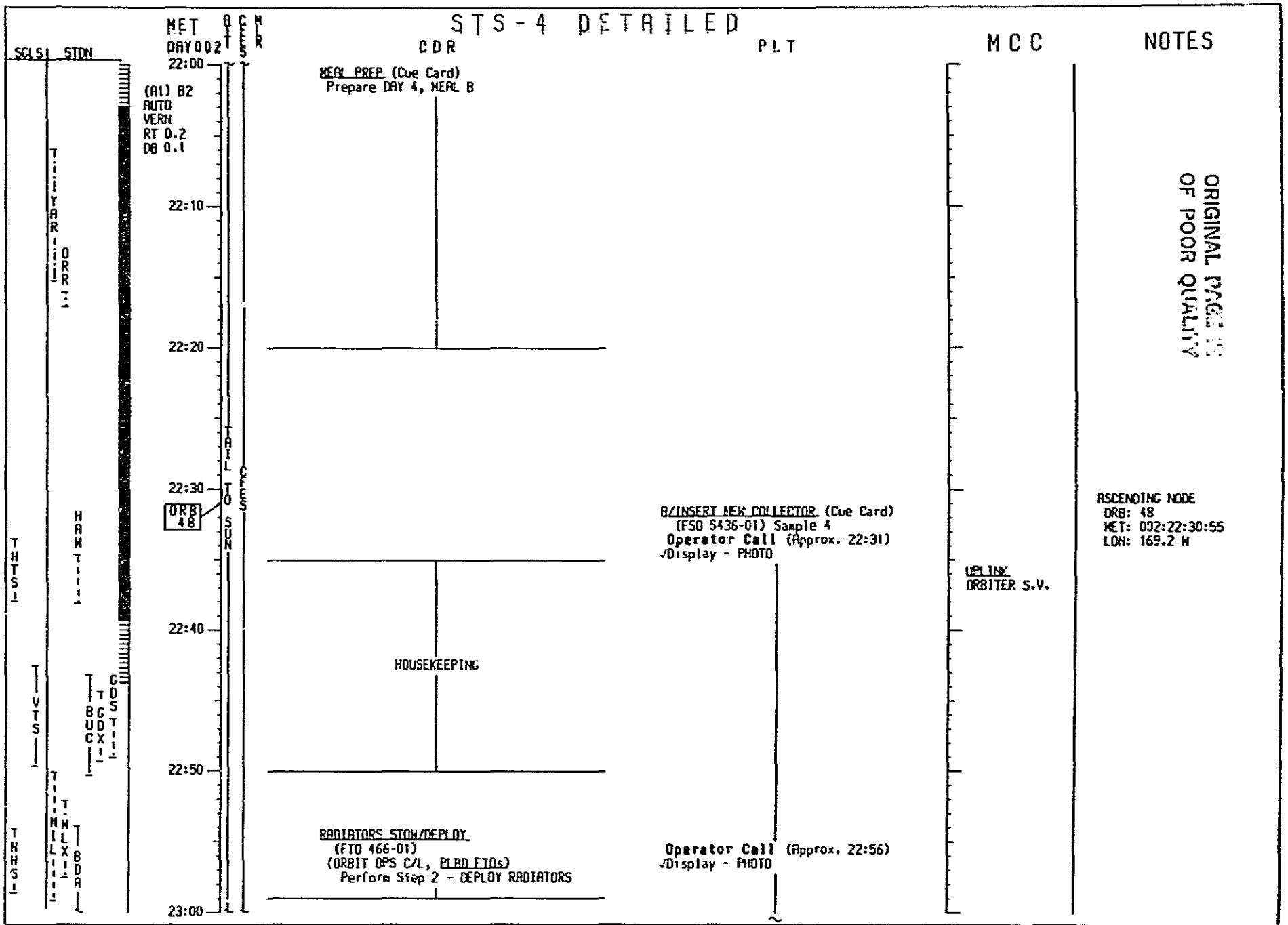
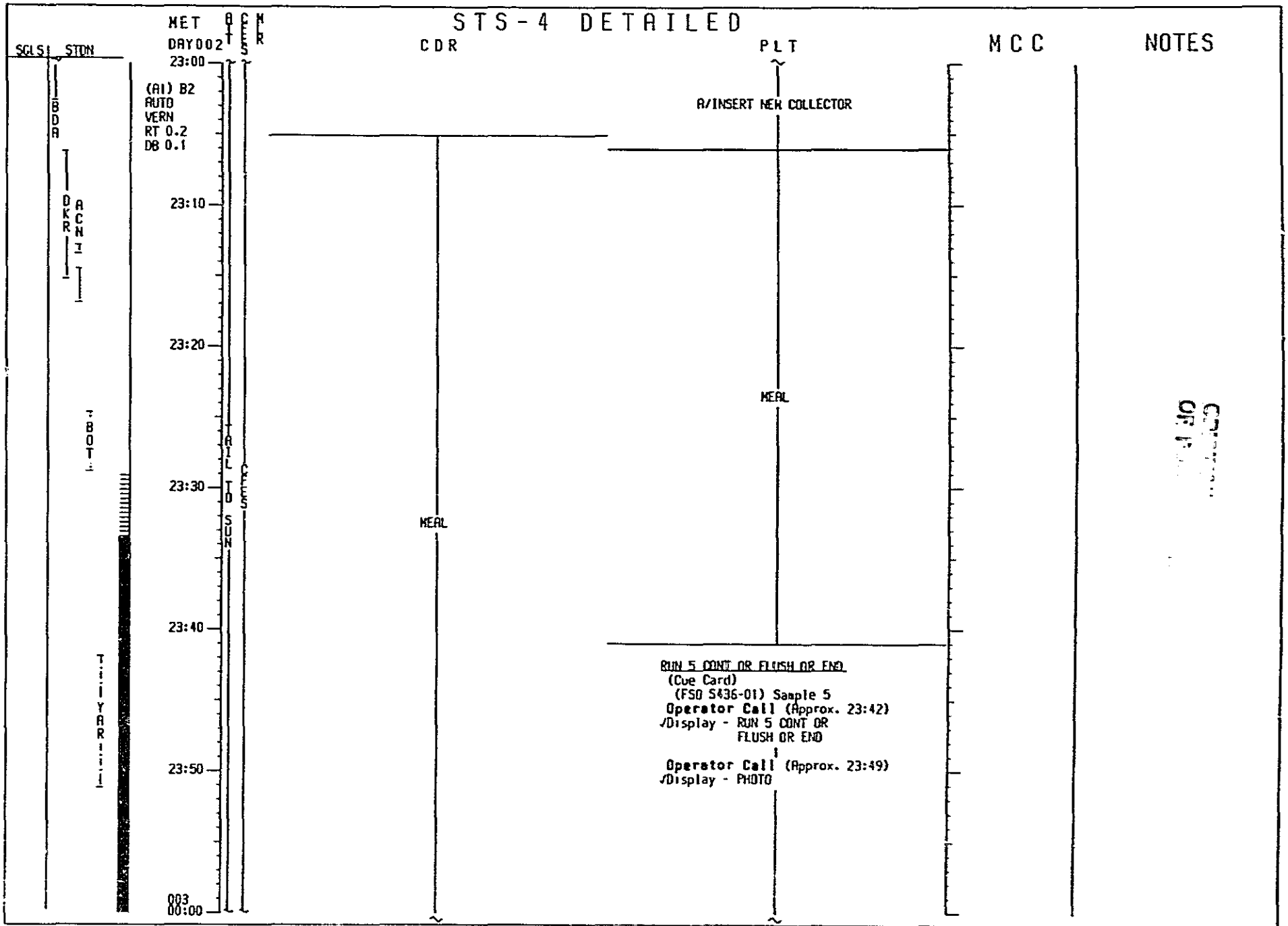
STS-4 DETAILED

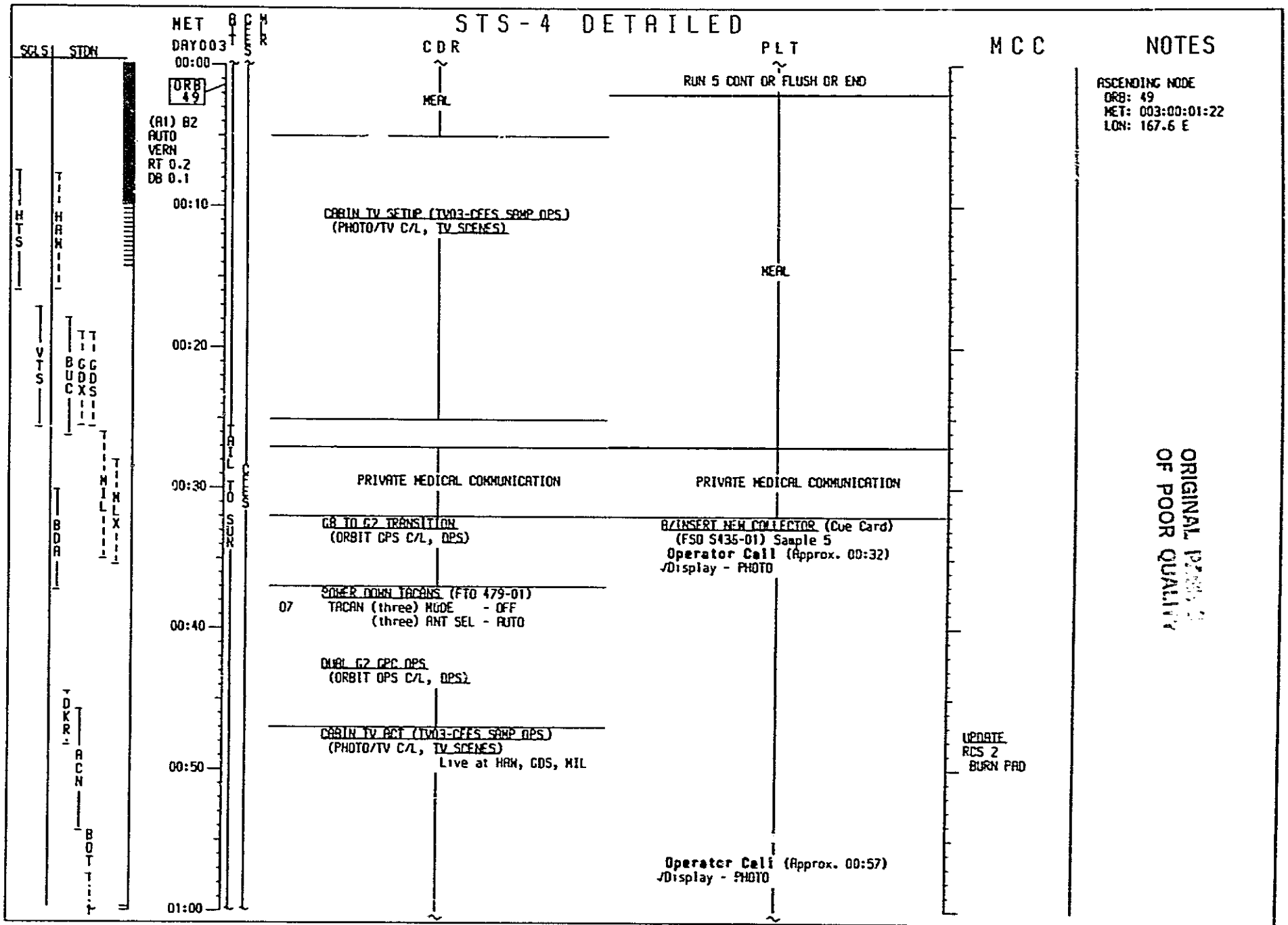


STS-4 DETAILED



5/14/82 STS4FIN

STS-4 DETAILED



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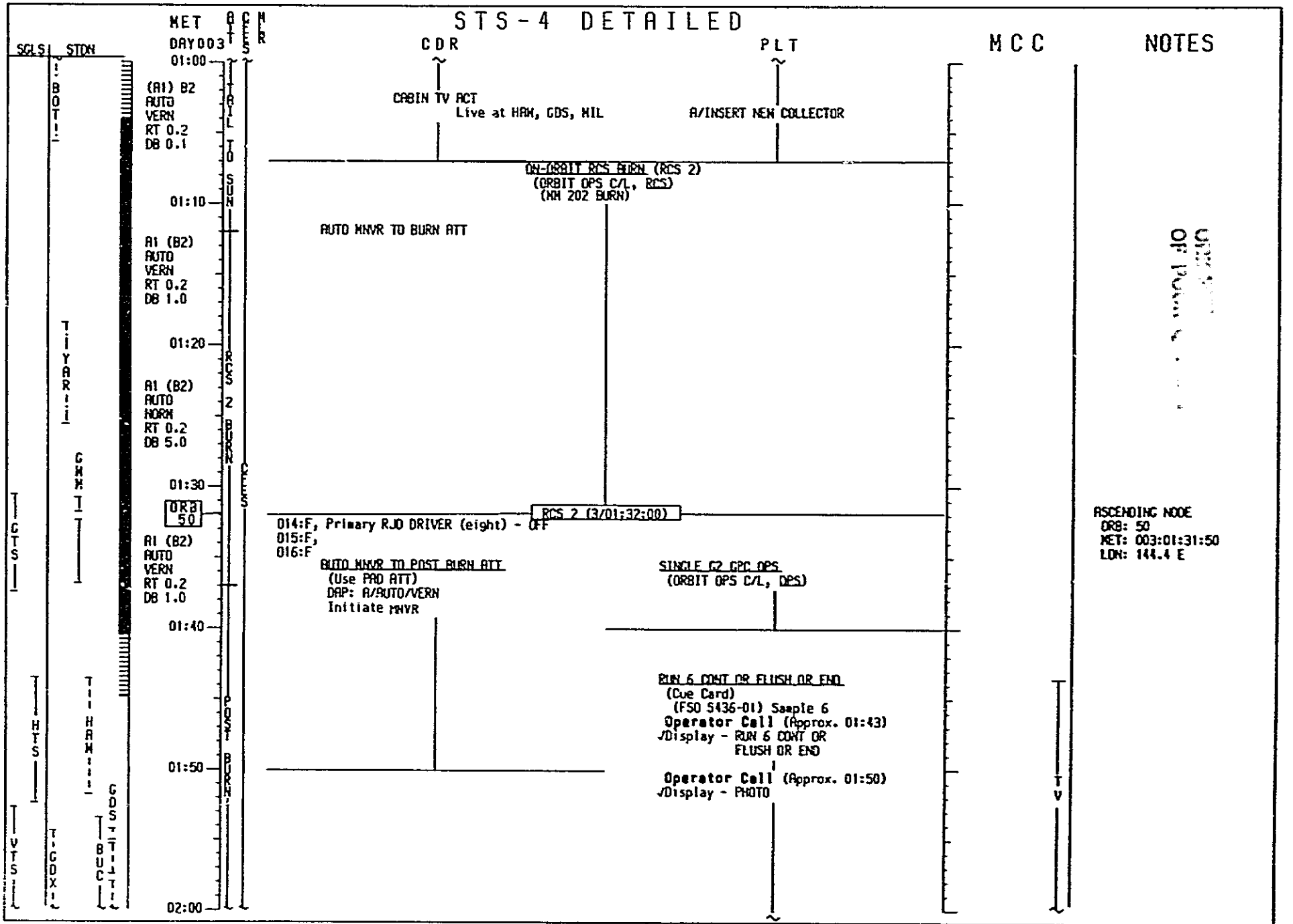
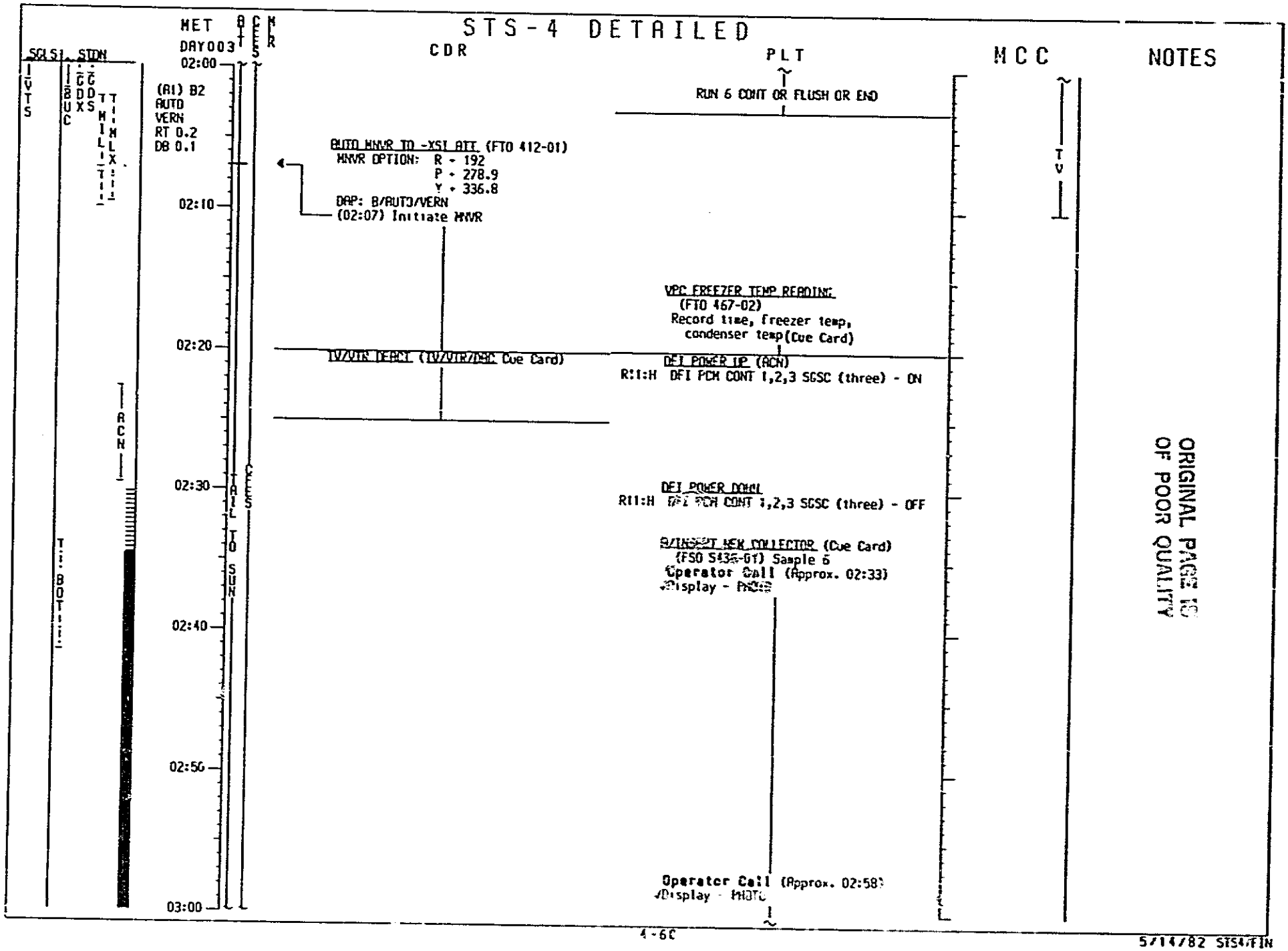
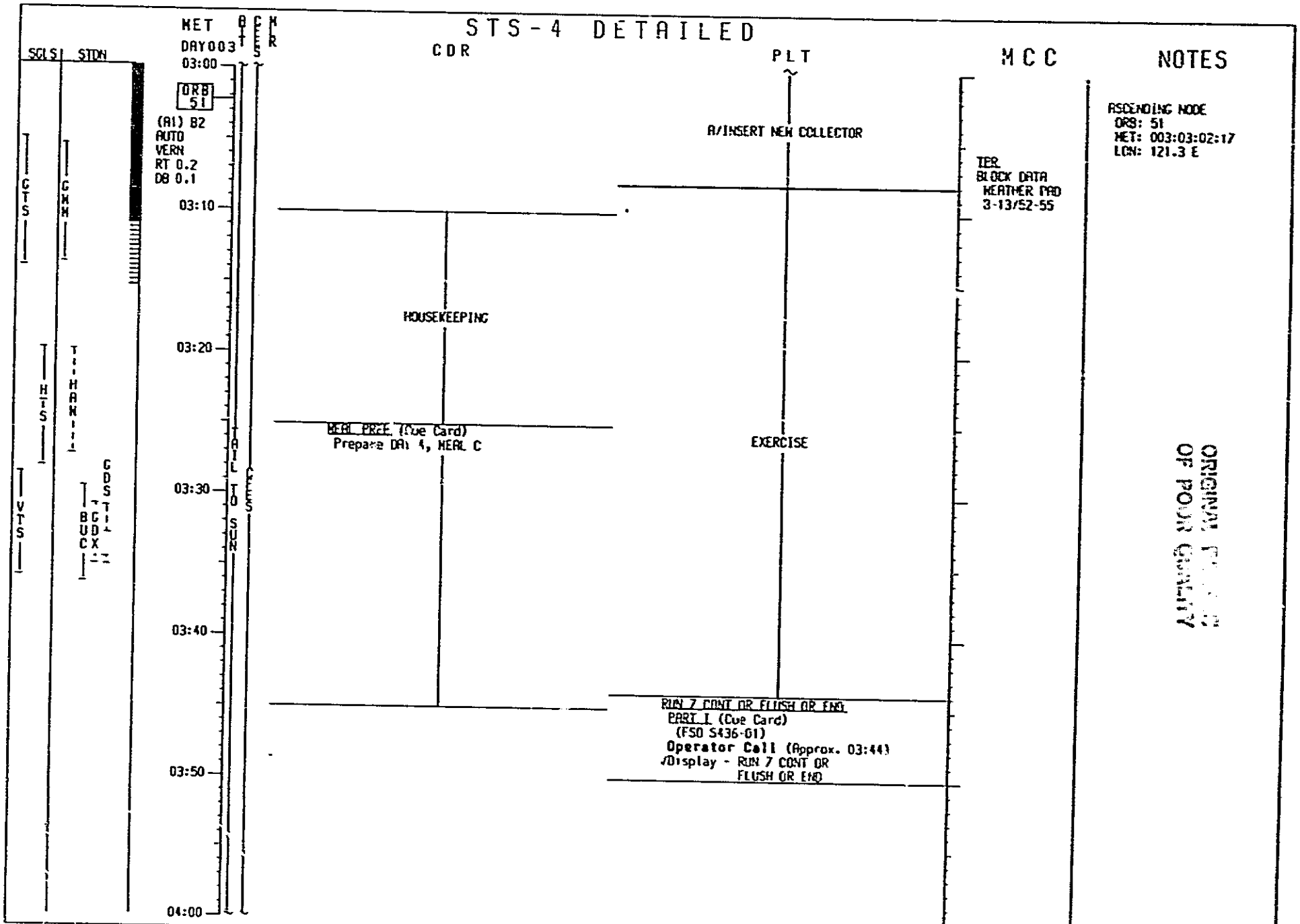


5/14/82 STS4/FIN



5/14/82 STS4FIN

STS-4 DETAILED



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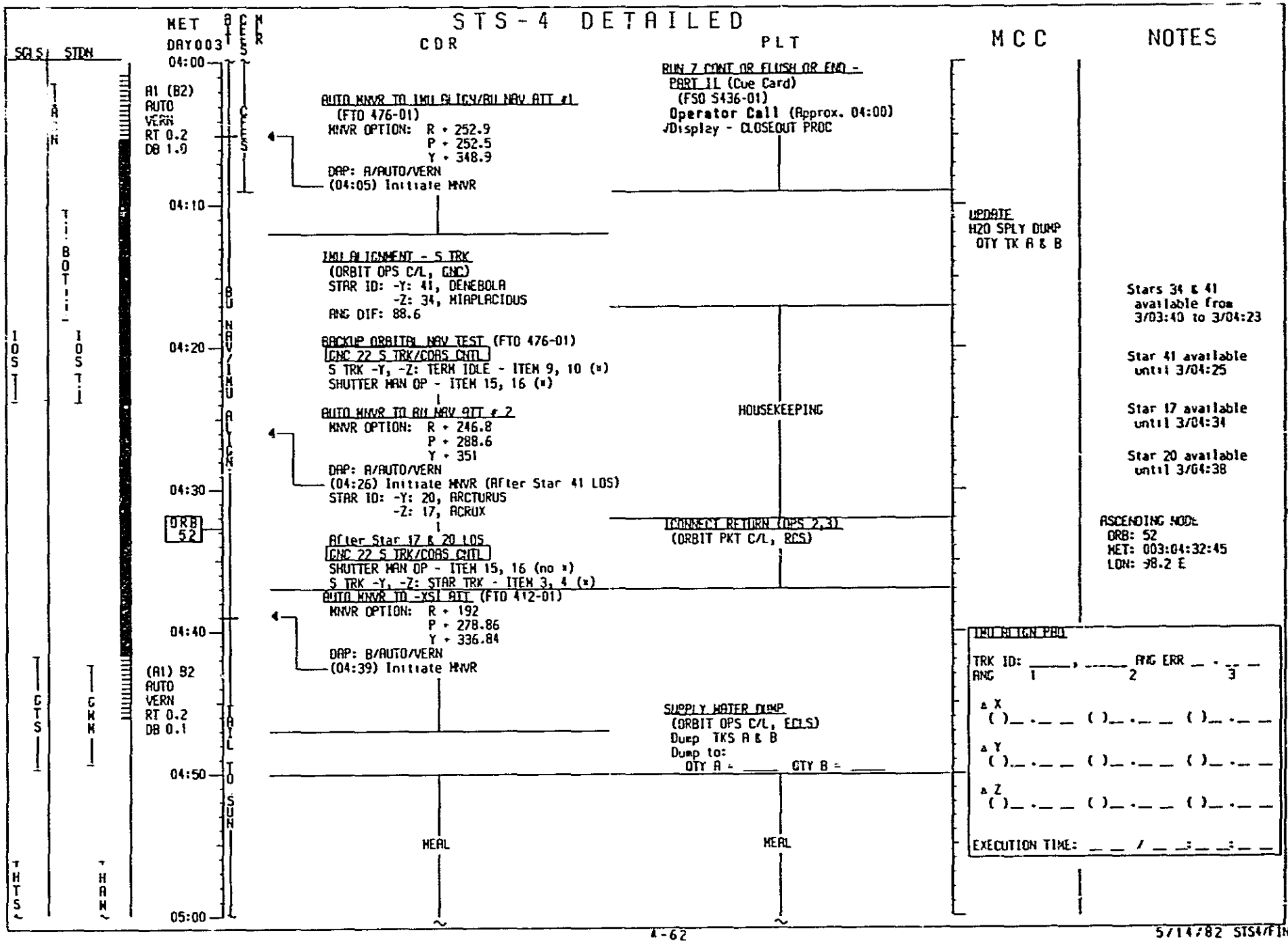
STS-4 DETAILED



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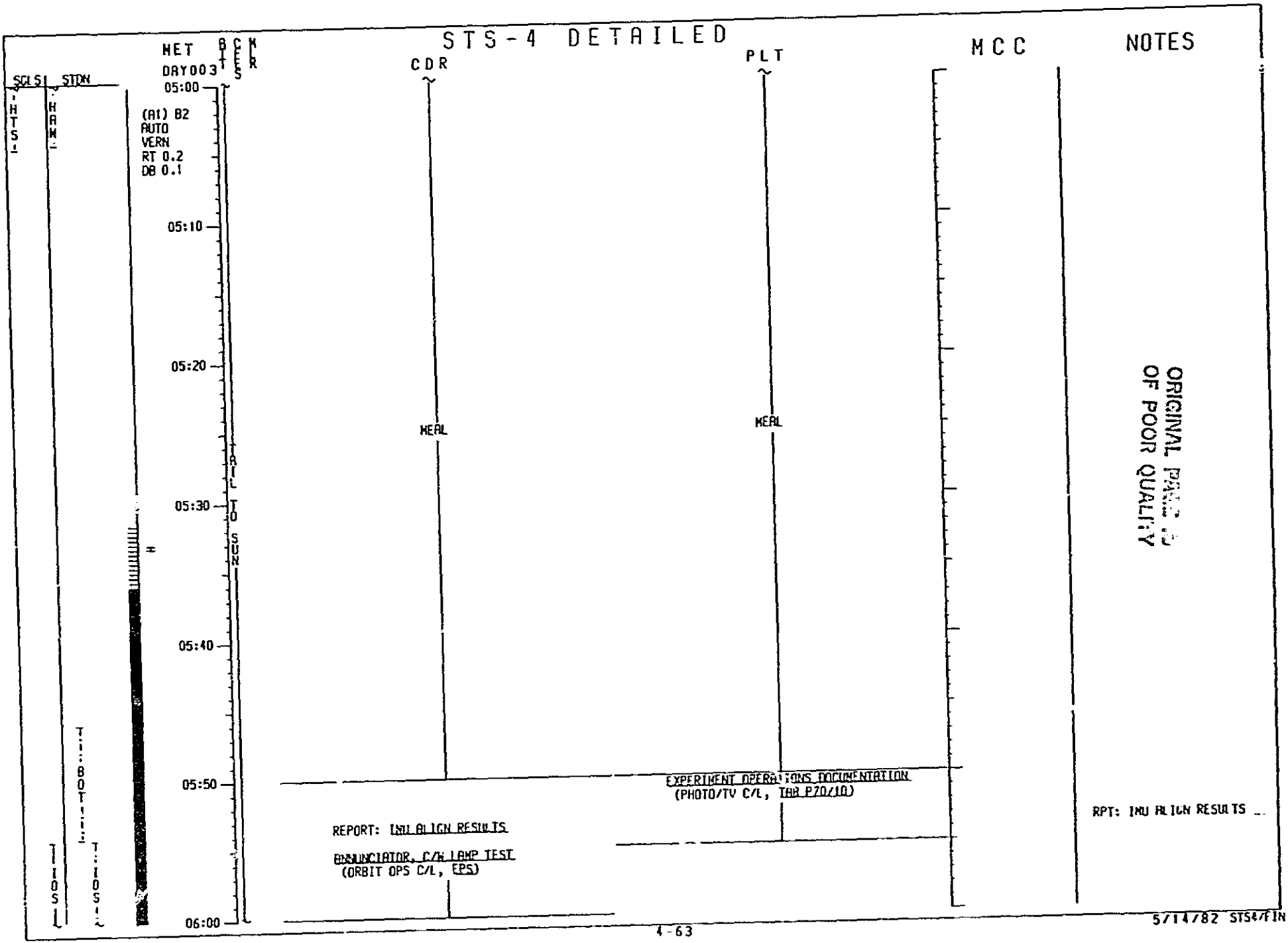
C-2

5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 003
SGLS
STDN
HTSL
HAWL
TILOS
BOTH
TILOS
TILOS
05:00
05:10
05:20
05:30
05:40
05:50
06:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
CDR
PLT
MEAL
MEAL
MCC
NOTES
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P70/10)
REPORT: INU ALIGN RESULTS
ANNUNCIATOR, C/W LAMP TEST
(ORBIT OPS C/L, EPS)
RPT: INU ALIGN RESULTS
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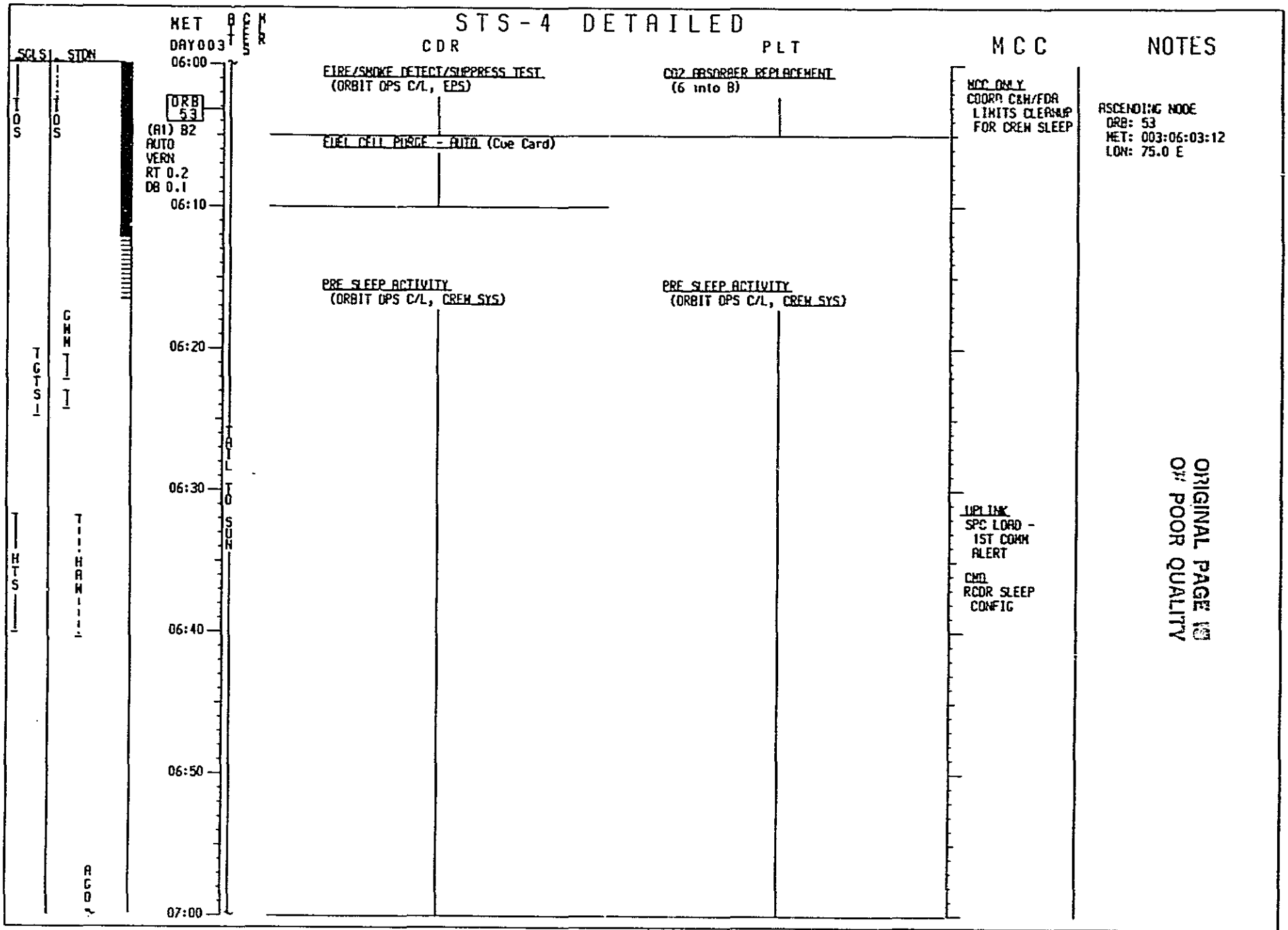
5/14/82 STS4/FIN

STS-4 DETAILED



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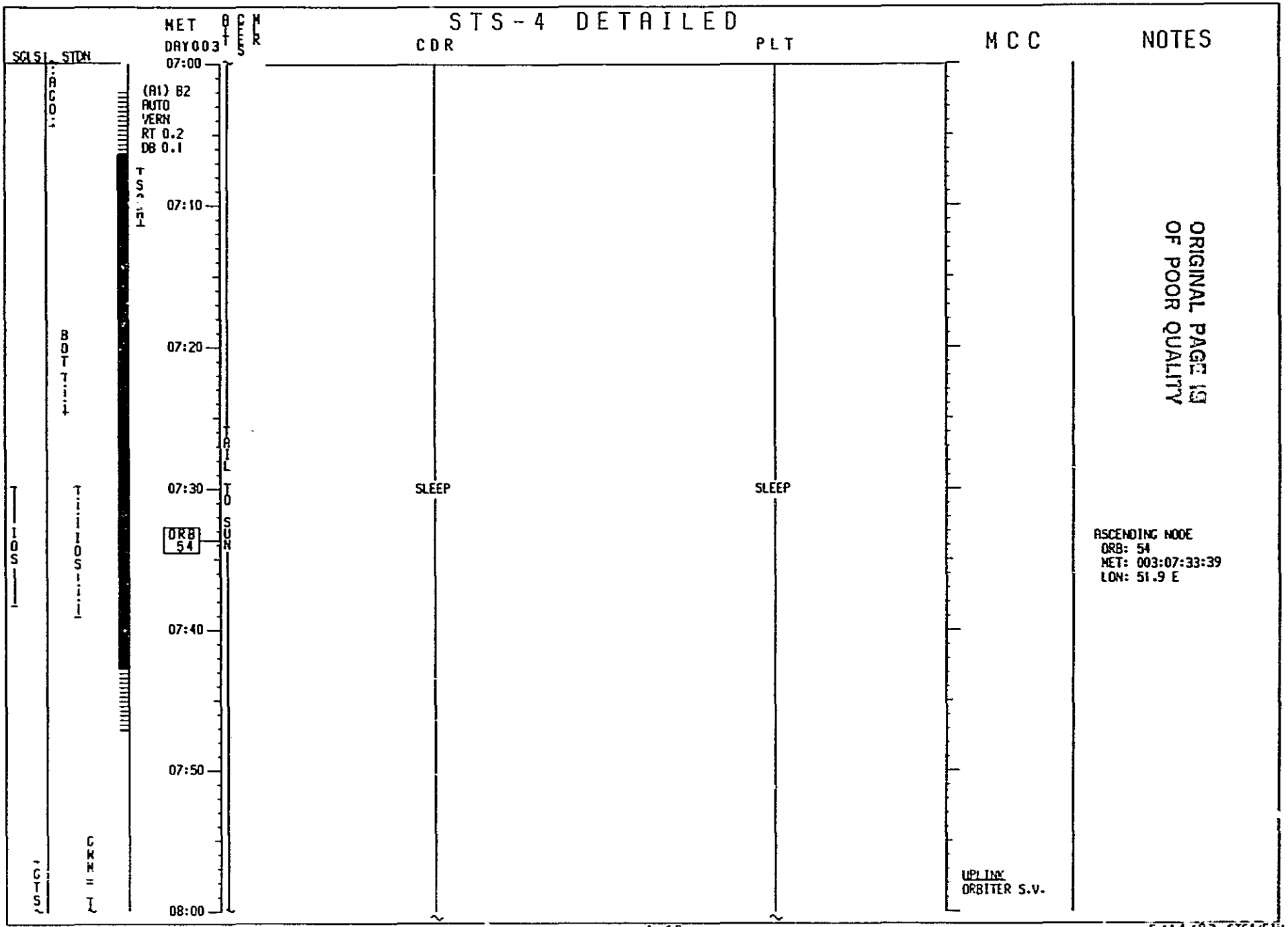
STS-4 DETAILED



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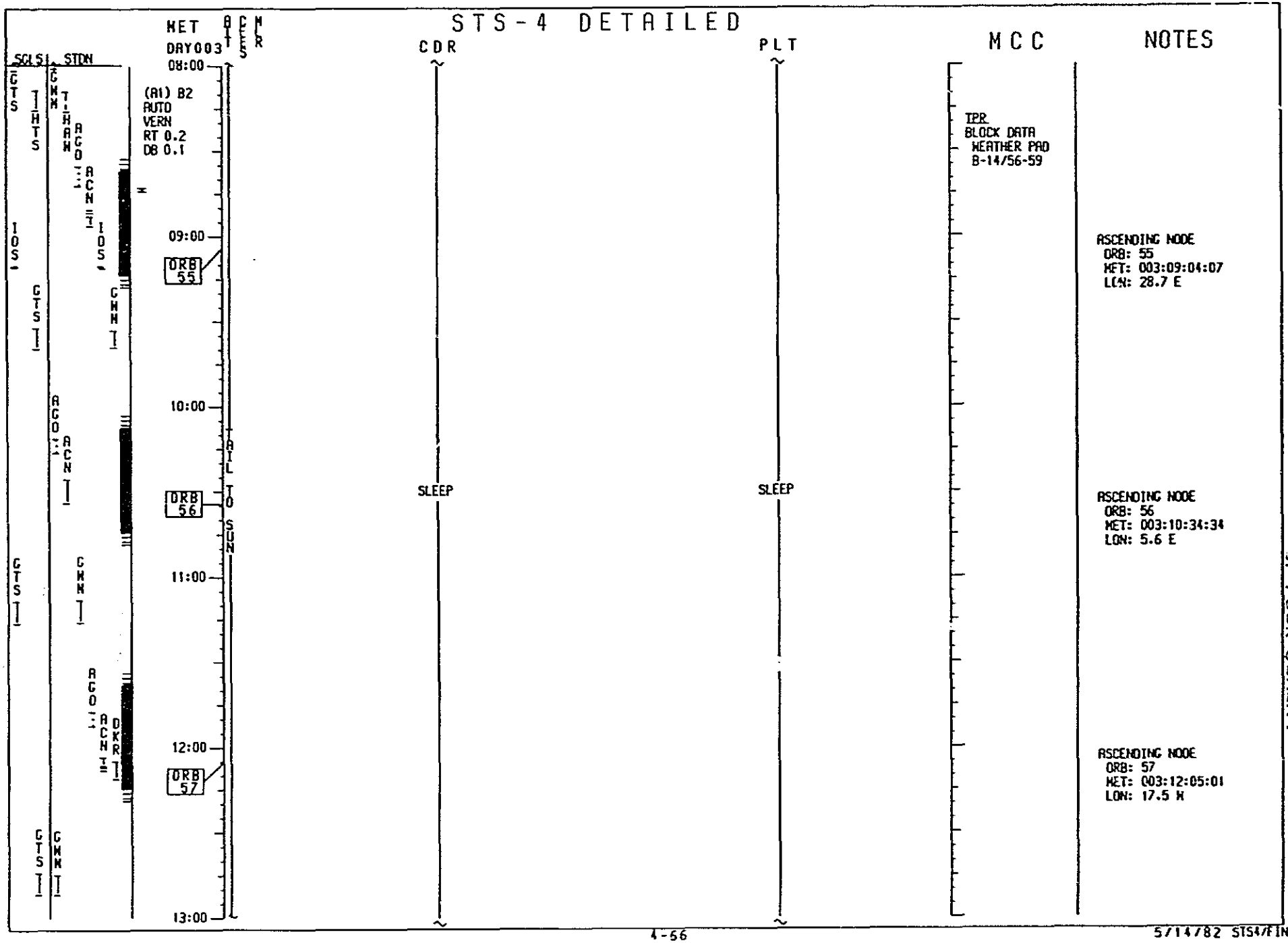
5/14/82 STS4/FIN

STS-4 DETAILED



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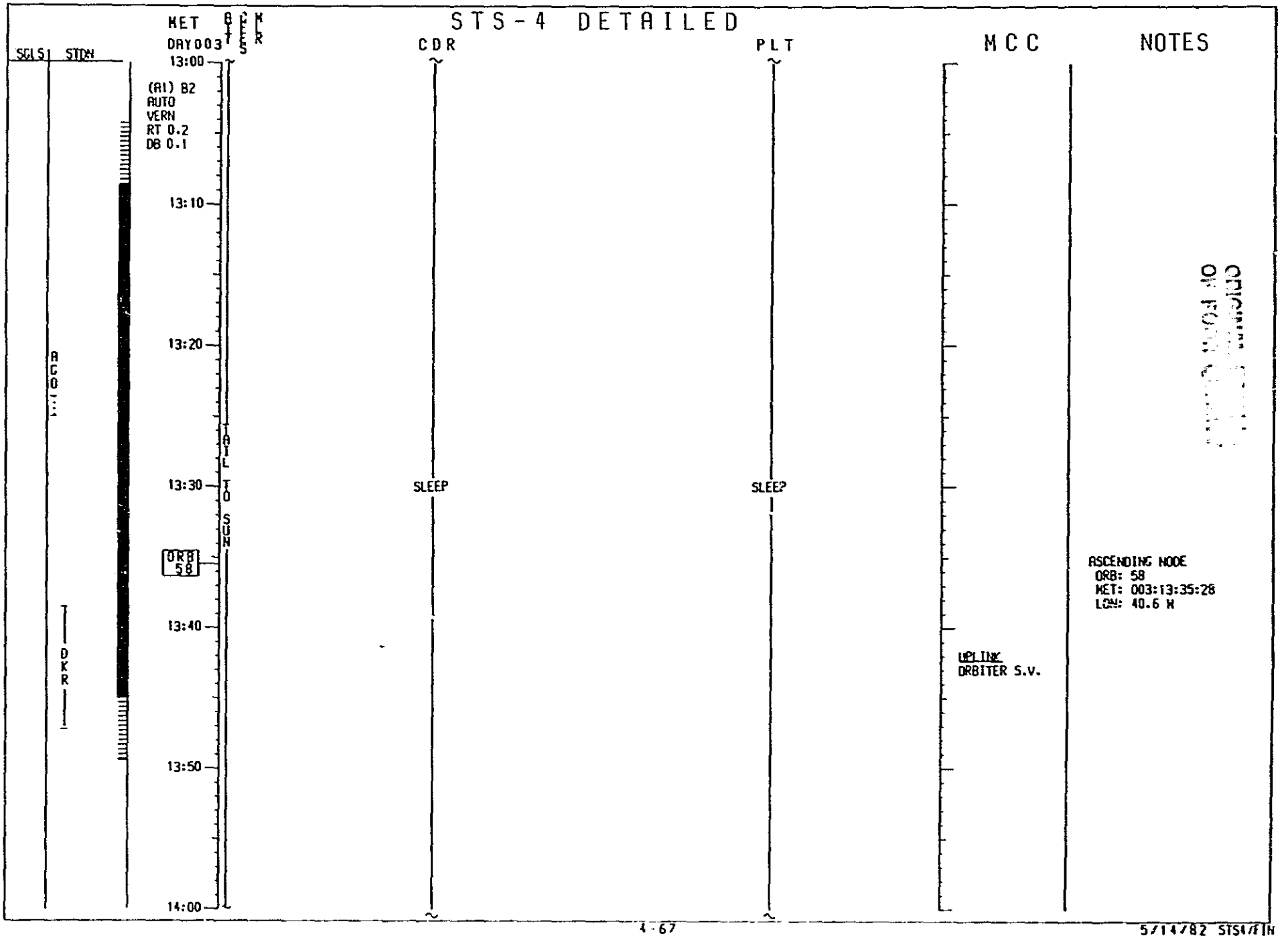
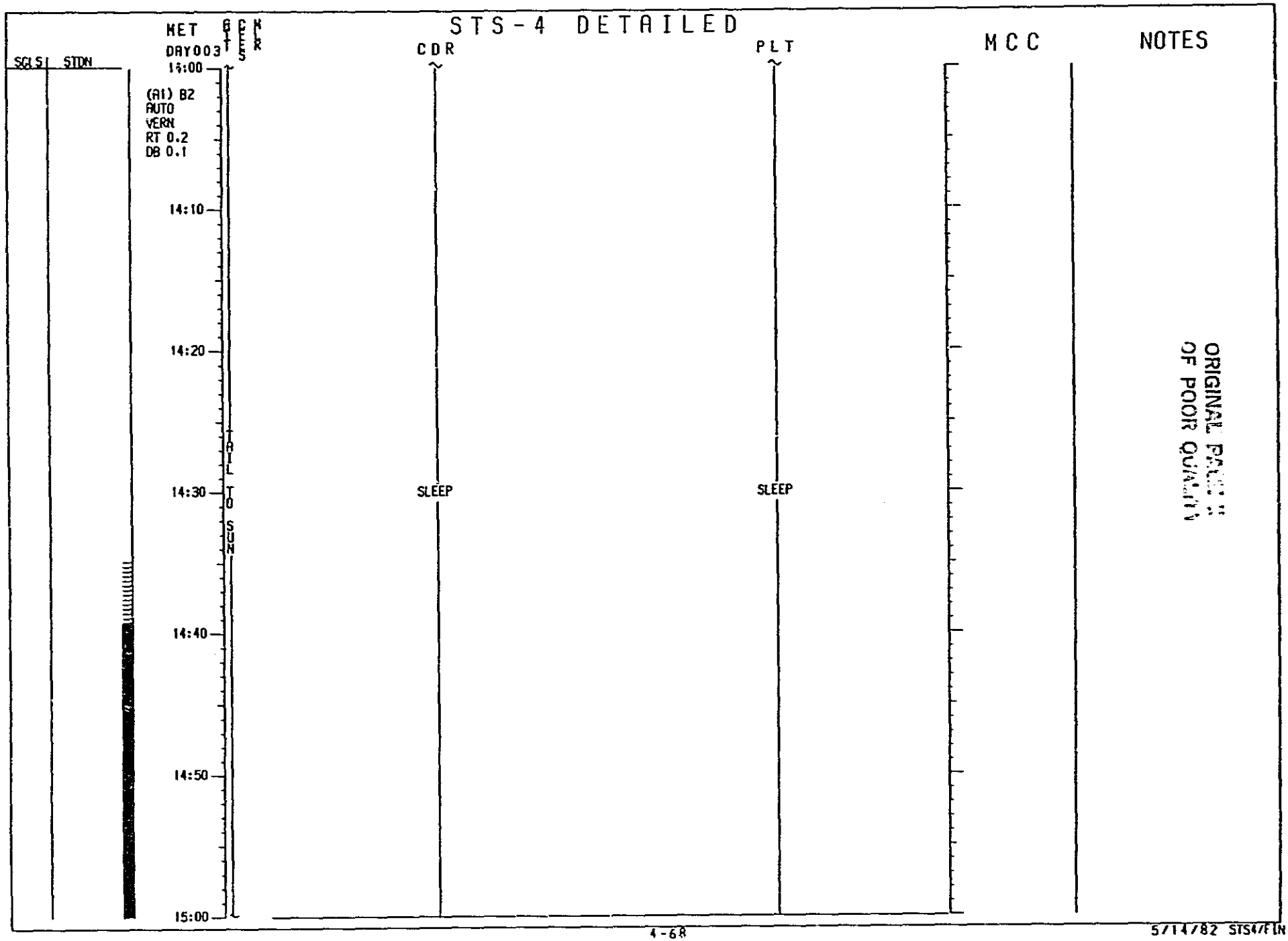
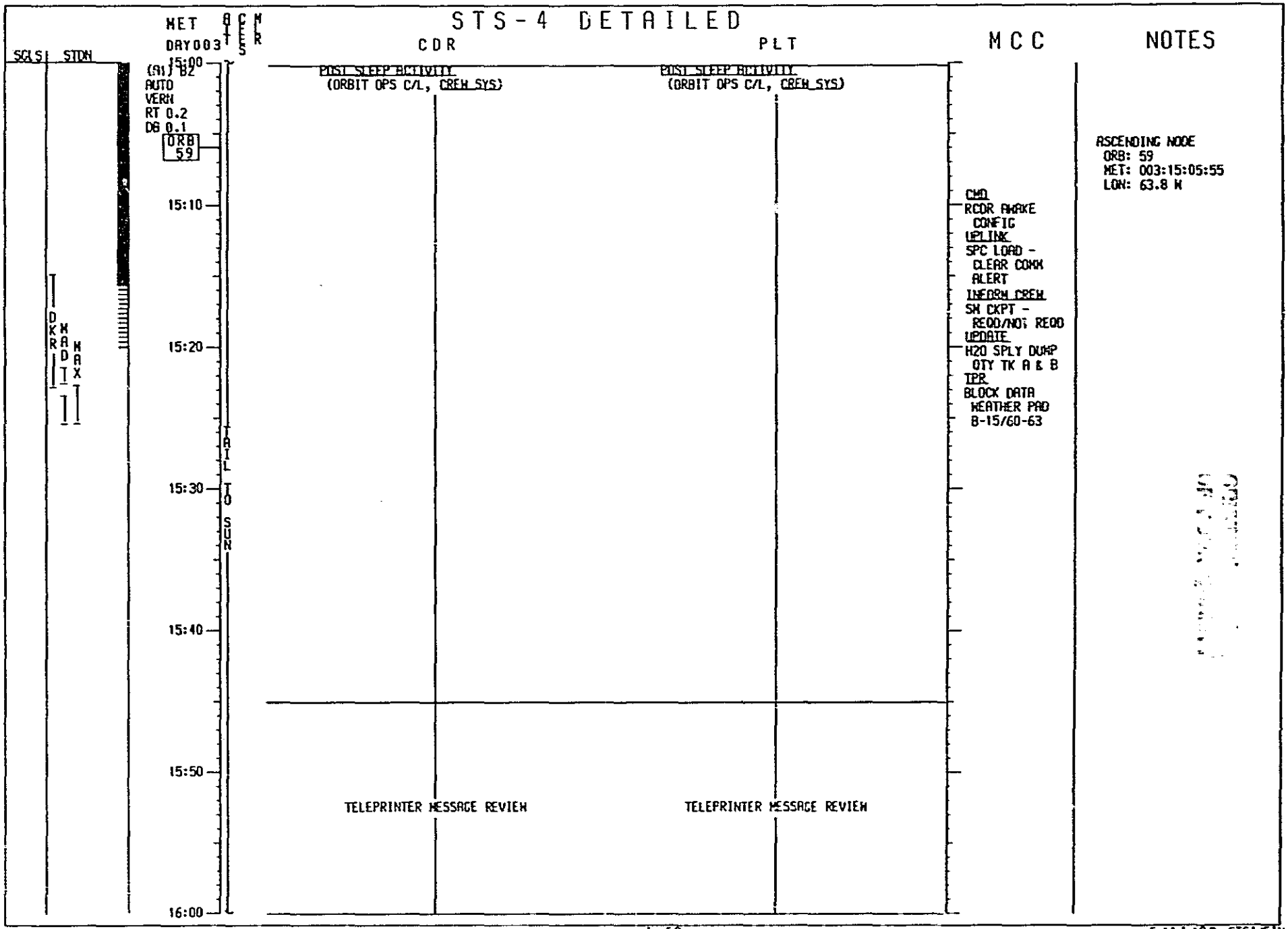
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 003
SGLS
STDN
BITS
MKR
13:00
13:10
13:20
13:30
13:40
13:50
14:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
AOS
AIL TO SUN
DKR
ORB 58
CDR
PLT
SLEEP
SLEEP
MCC
NOTES
UPLINK
ORBITER S.V.
ASCENDING NODE
ORB: 58
MET: 003:13:35:28
LON: 40.6 W
4-67
5/14/82 STS4/FIN

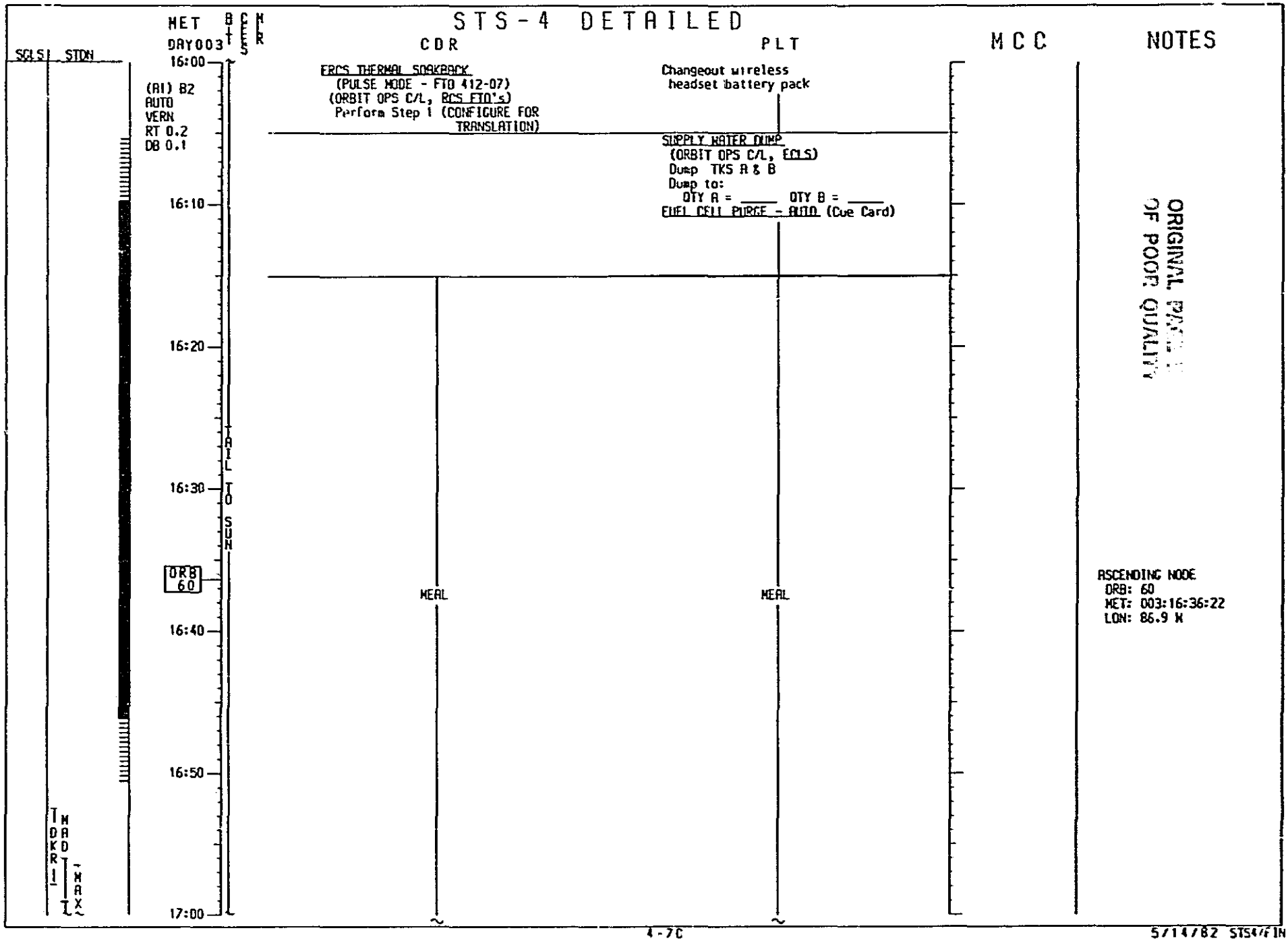
FLT DAY 5


STS-4 DETAILED
MET
DAY003
SGLS
STDN
GETS
CKR
CDR
PLT
MCC
NOTES
16:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
14:10
14:20
14:30
14:40
14:50
15:00
AIL TO SUN
SLEEP
SLEEP
ORIGINAL PAGE IS
OF POOR QUALITY
4-6R
5/14/82 STS4/FIN

STS-4 DETAILED



STS-4 DETAILED



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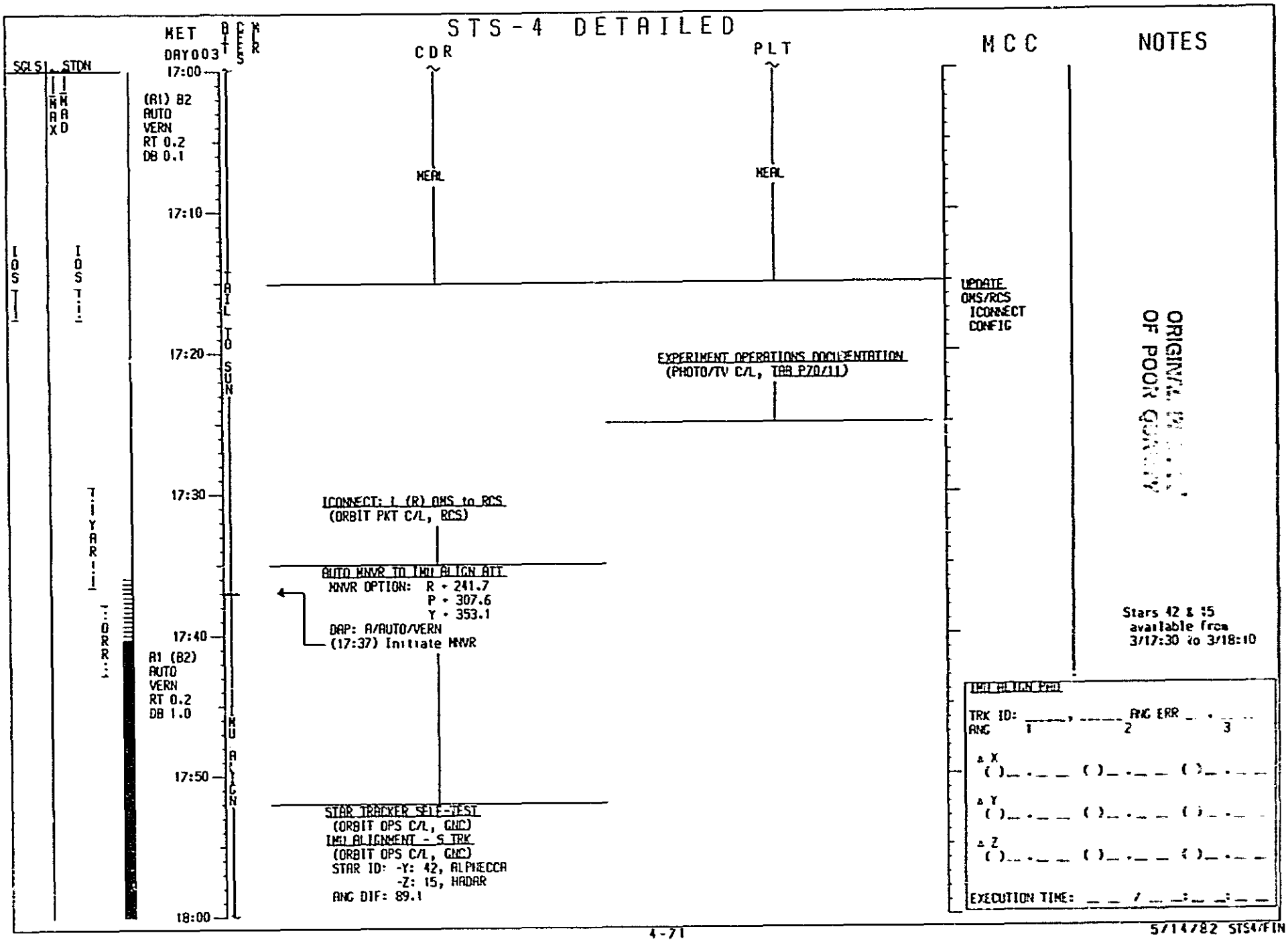
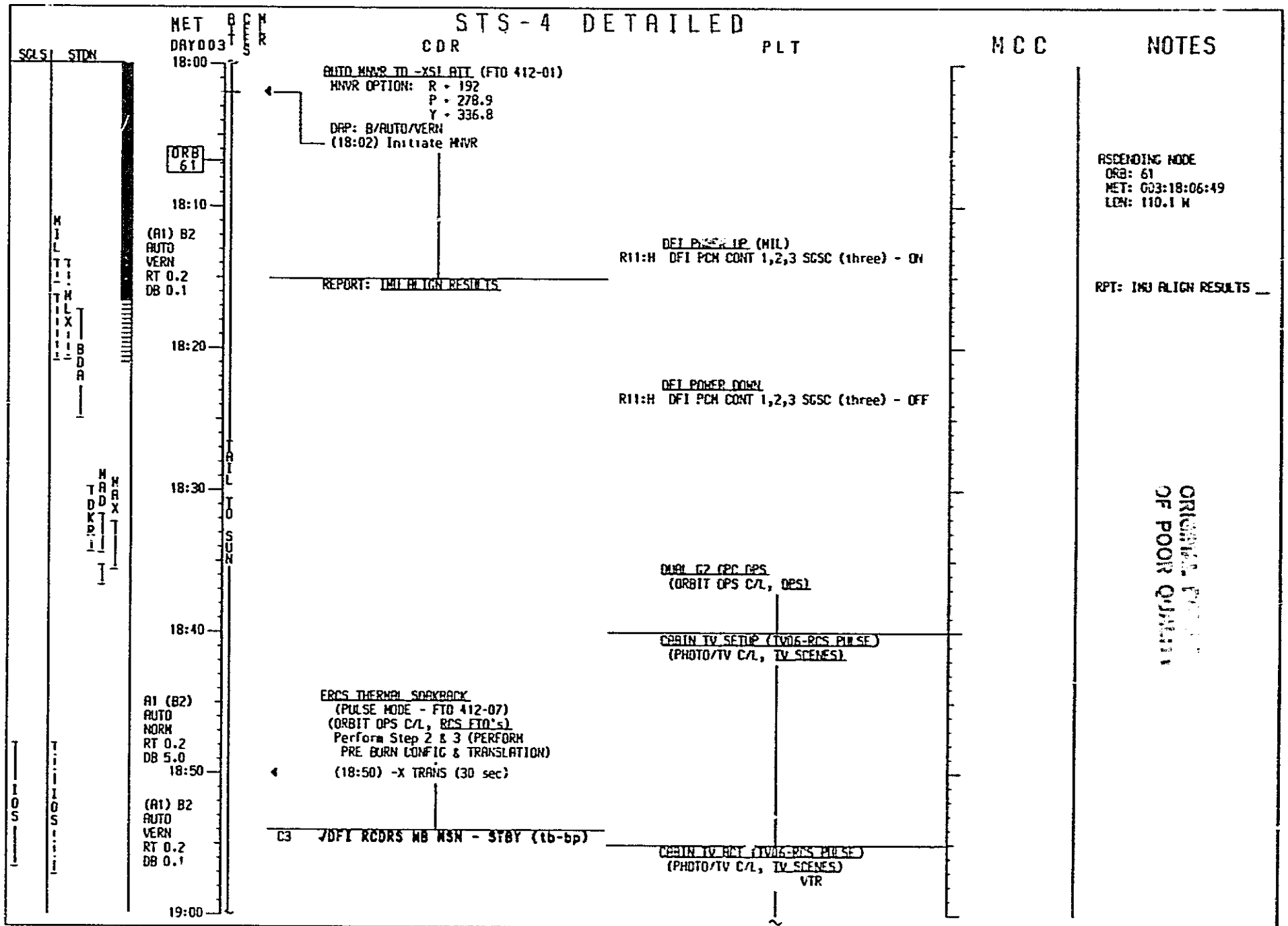
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY003
SCLS
STDN
MAXD
IOS
TAR
17:00
17:10
17:20
17:30
17:40
17:50
18:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
TAIL TO SUN
NU ALIGN
CDR
PLT
MCC
NOTES
MEAL
MEAL
UPDATE
OMS/RCS
ICONNECT
CONFIG
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P/O/11)
ICONNECT: L (R) OMS to RCS
(ORBIT PKT C/L, RCS)
AUTO MNVR TO INU ALIGN ATT
MNVR OPTION: R = 241.7
P = 307.6
Y = 353.1
DAP: A/AUTO/VERN
(17:37) Initiate MNVR
STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
INU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 42, ALPHECCA
-Z: 15, HADAR
ANG DIF: 89.1
ORIGINAL PAGE IS
OF POOR QUALITY
Stars 42 & 15
available from
3/17:30 to 3/18:10
INU ALIGN PAD
TRK ID: ANG 1 2 3
ANG ERR
Δ X
Δ Y
Δ Z
EXECUTION TIME:

STS-4 DETAILED



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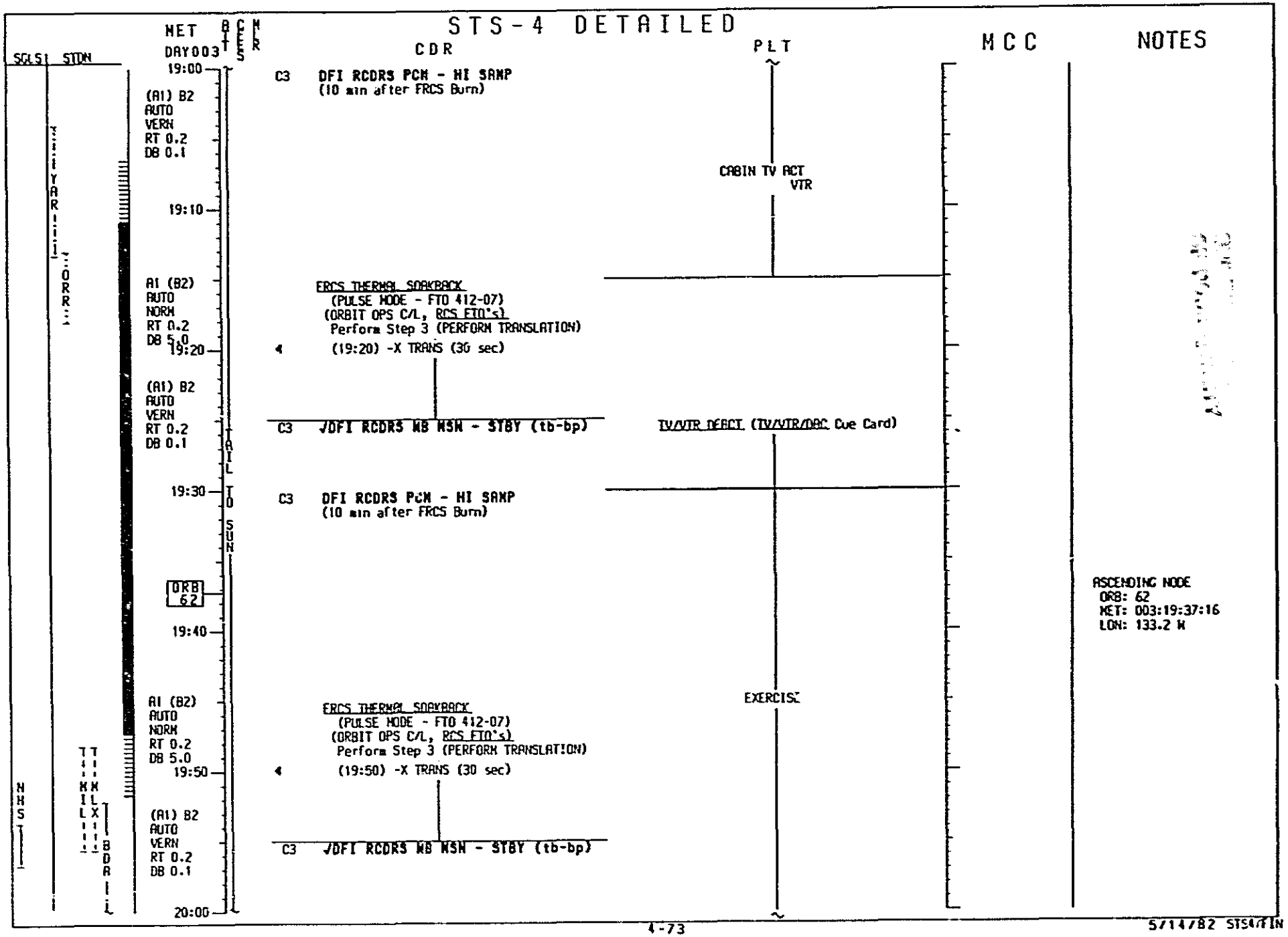
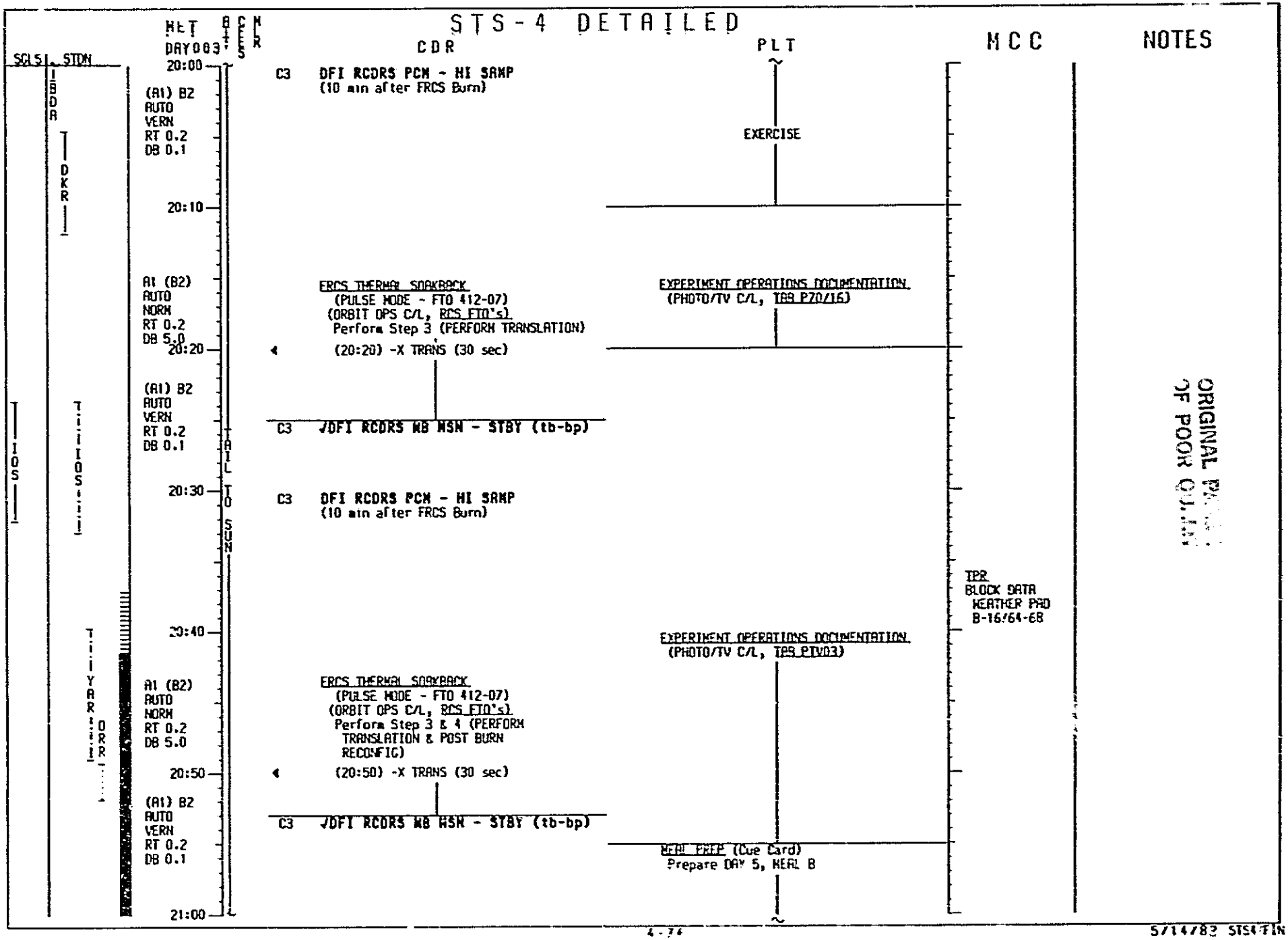
5/14/82 SIS4/FIN

STS-4 DETAILED



5/14/82 STS4/FIN

STS-4 DETAILED



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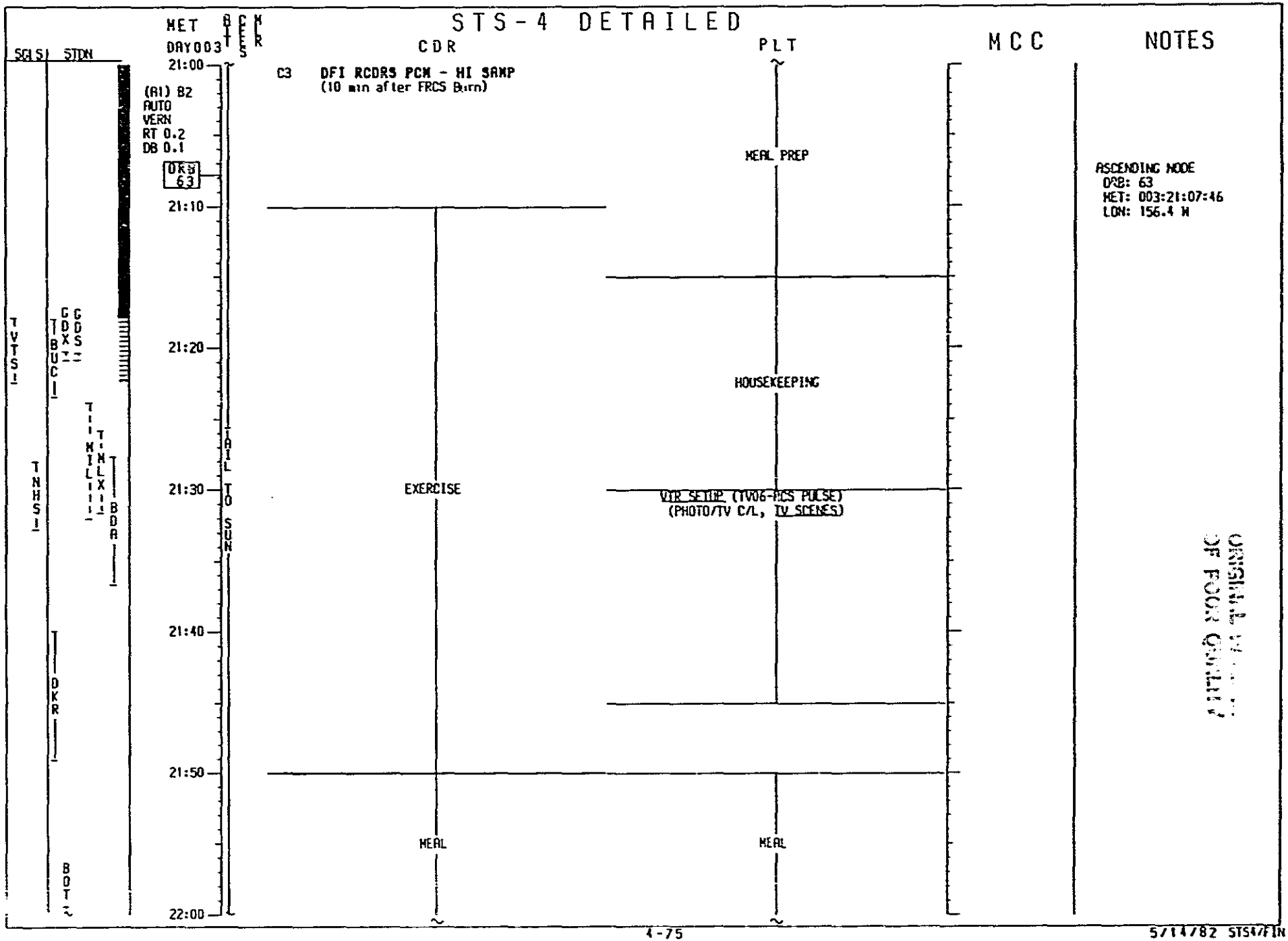
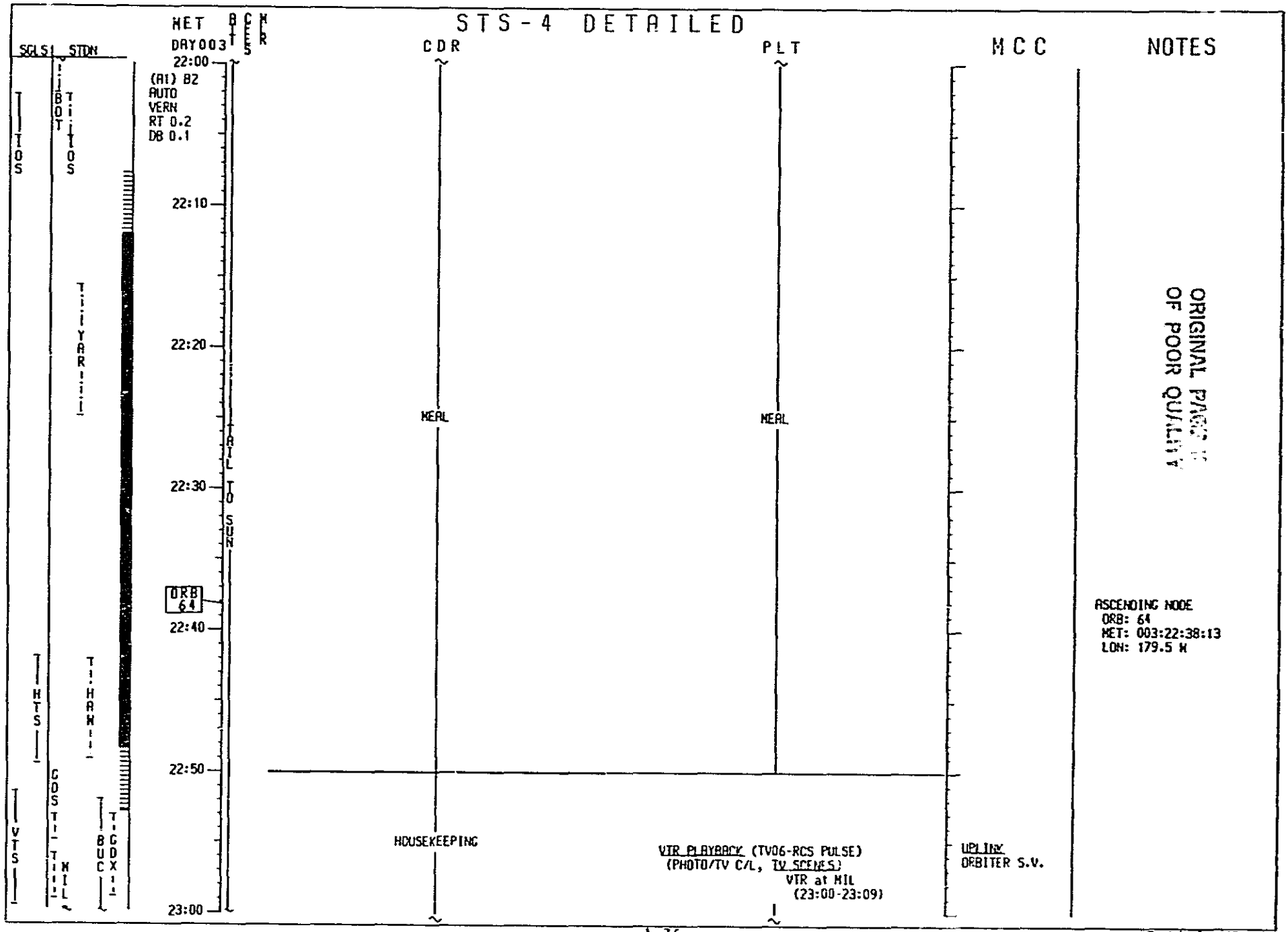
5/14/82 STS4FIN


STS-4 DETAILED
MET
DAY 003
SGLS
STDN
CDR
PLT
MCC
NOTES
21:00
21:10
21:20
21:30
21:40
21:50
22:00
C3 DFI RCDRS PCM - HI SAMP
(10 min after FRCS Burn)
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
DRS 63
MEAL PREP
HOUSEKEEPING
EXERCISE
VTR SETUP (TV06-RCS PULSE)
(PHOTO/TV C/L, TV SCENES)
MEAL
MEAL
AOS
LOS
TAIL TO SUN
ASCENDING NODE
DRB: 63
MET: 003:21:07:46
LON: 156.4 W
5/14/82 STS4/FIN

STS-4 DETAILED



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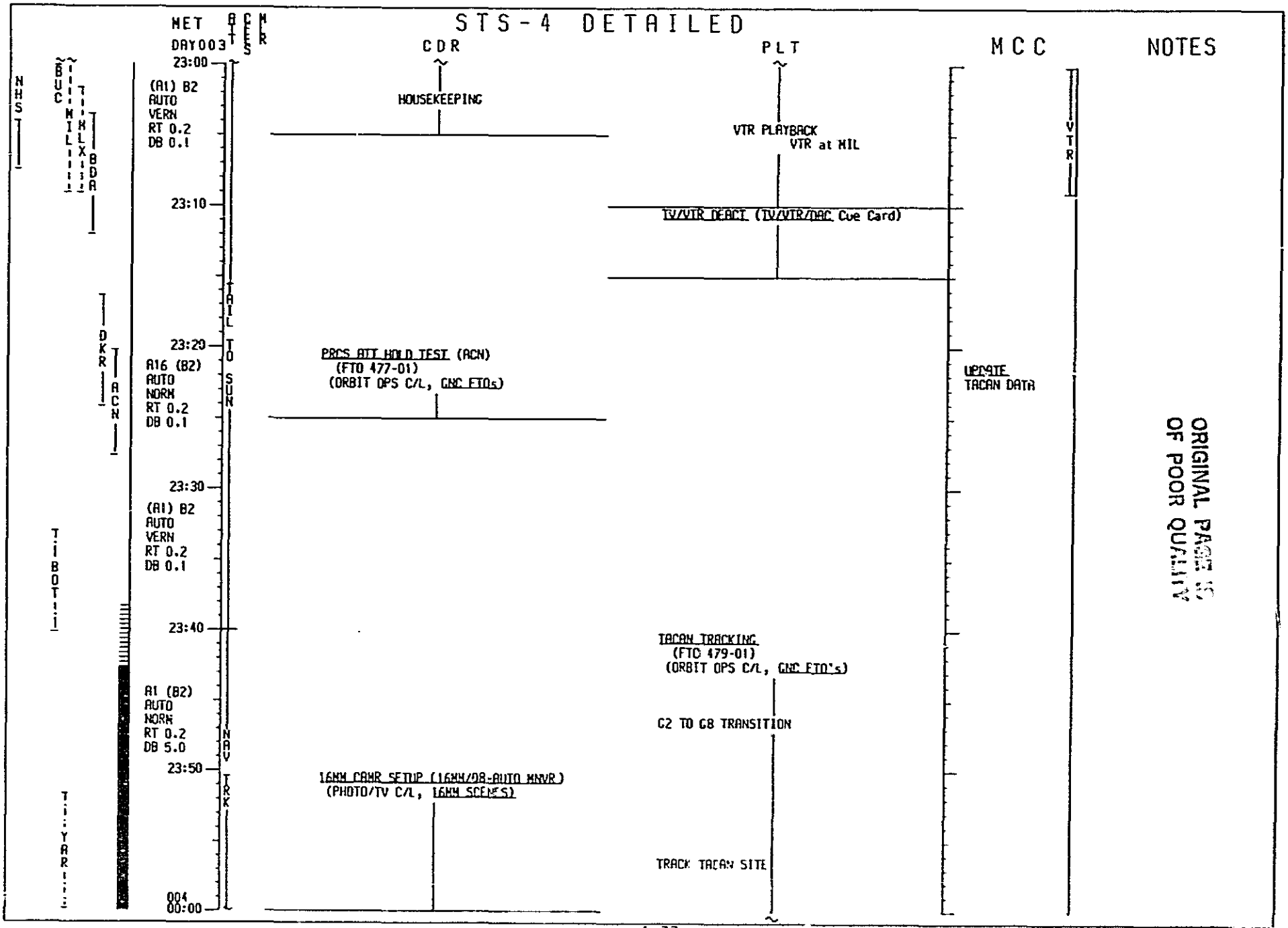
5/14/82 STS4/FIN

STS-4 DETAILED



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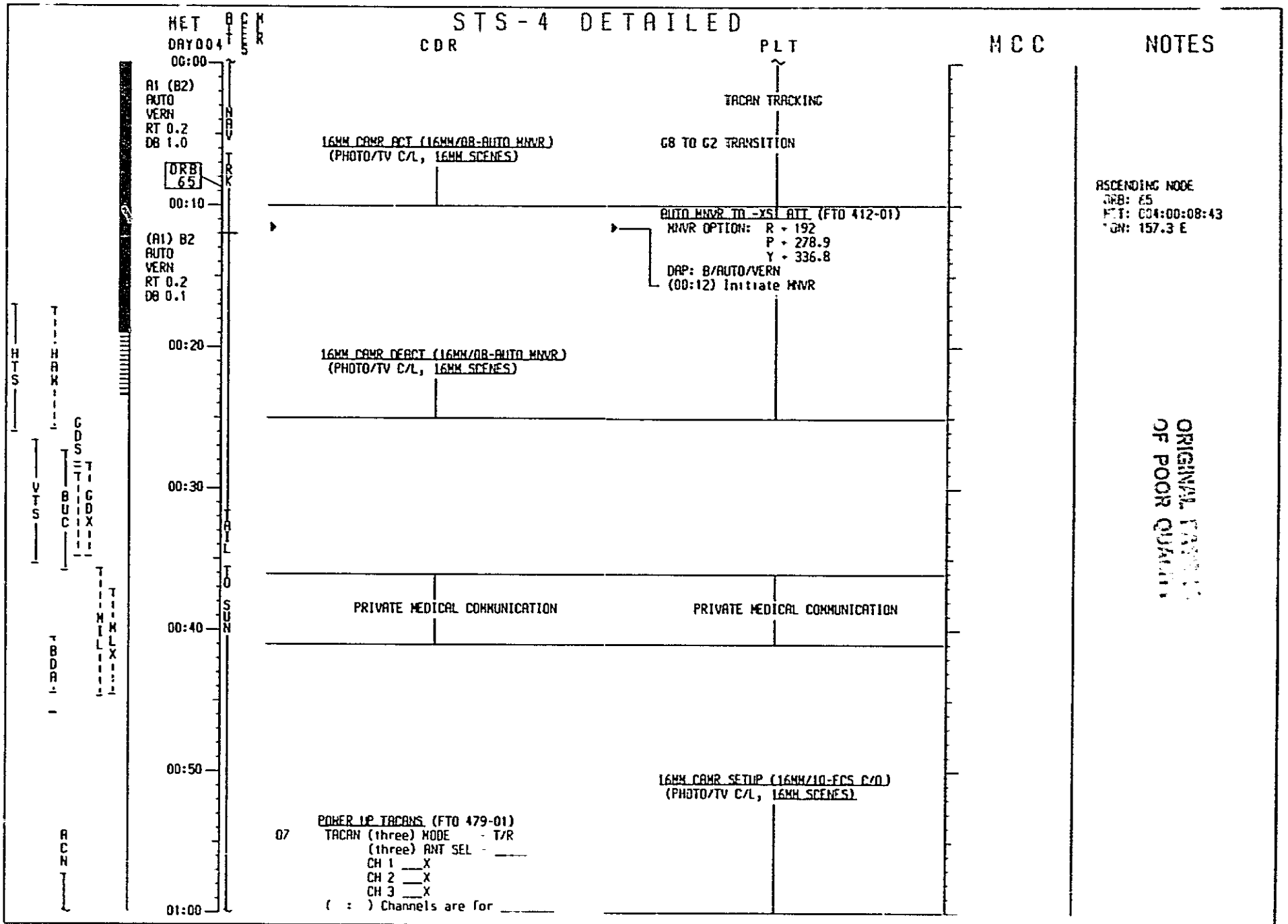
STS-4 DETAILED



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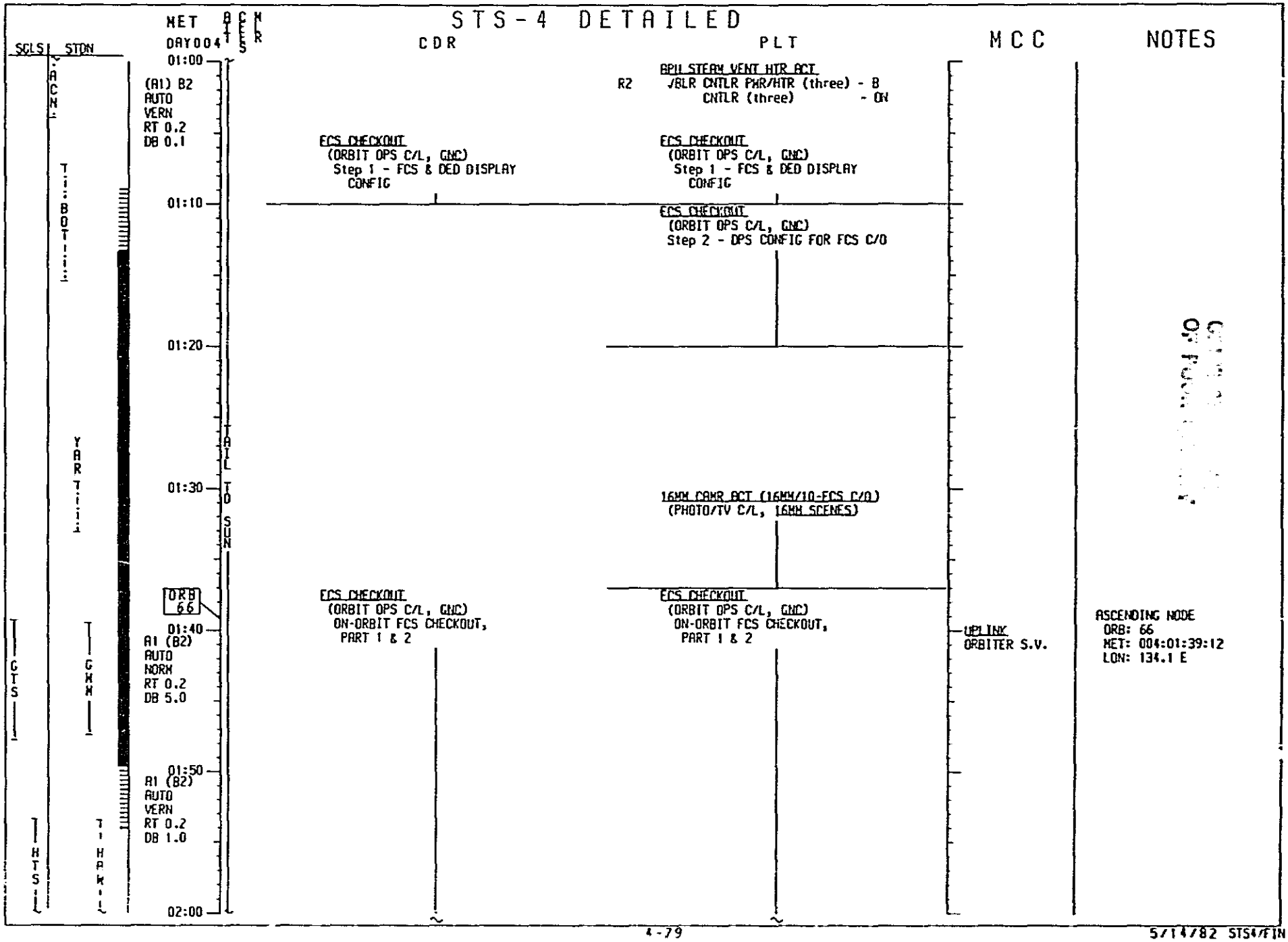
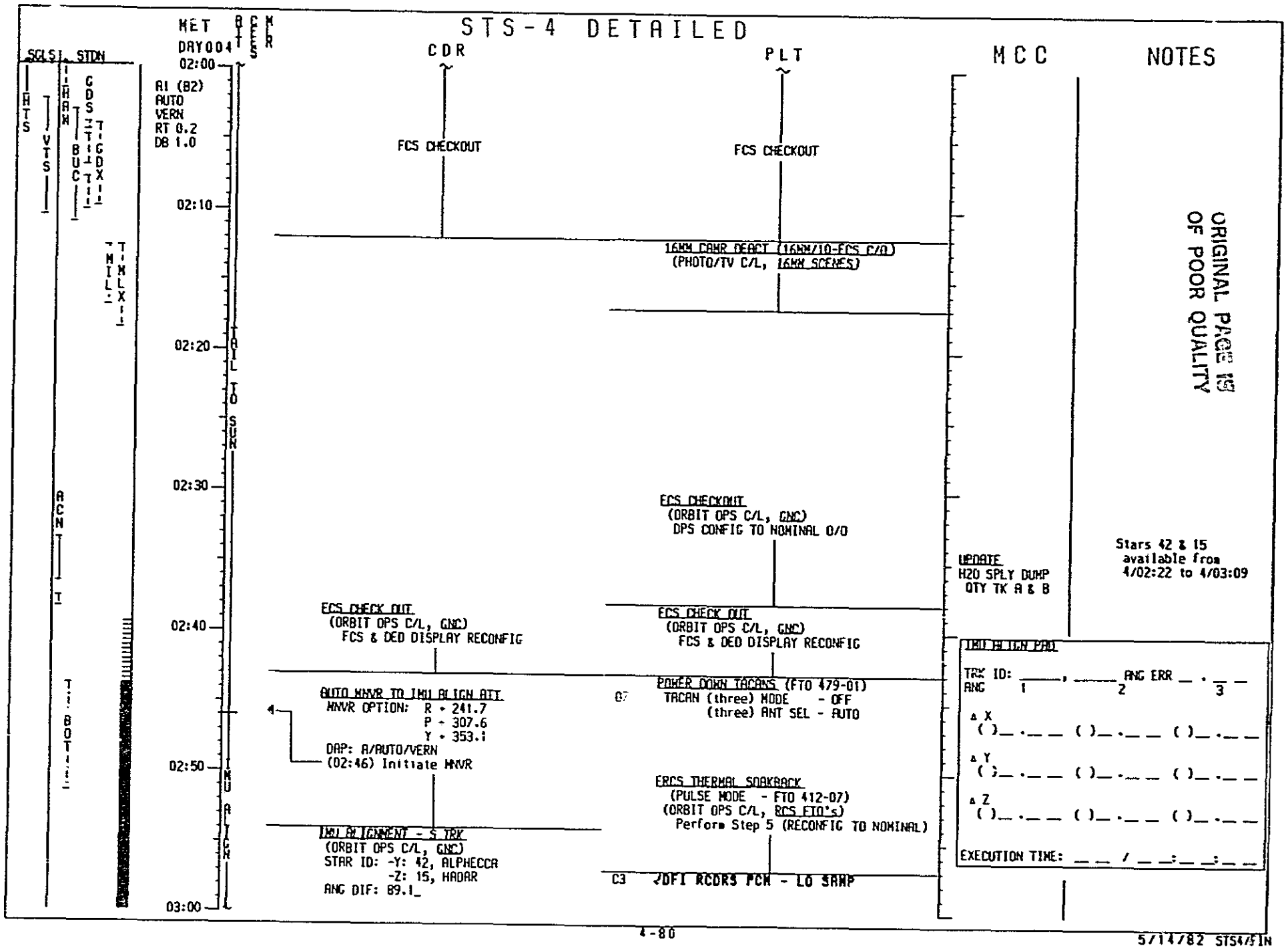
STS-4 DETAILED

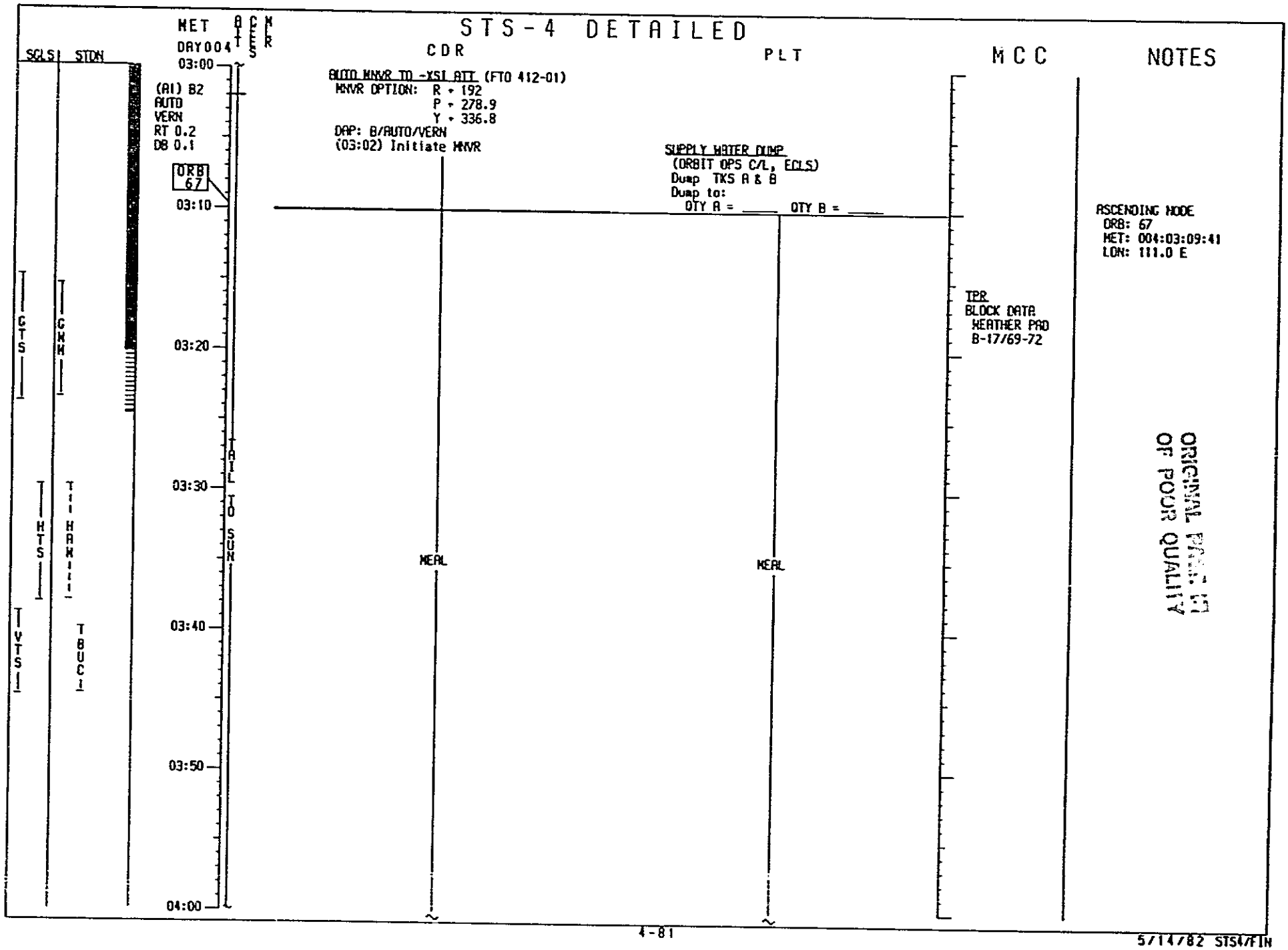


STS-4 DETAILED



5/14/82 STS4/5IN

STS-4 DETAILED



ORIGINAL PAGE IS
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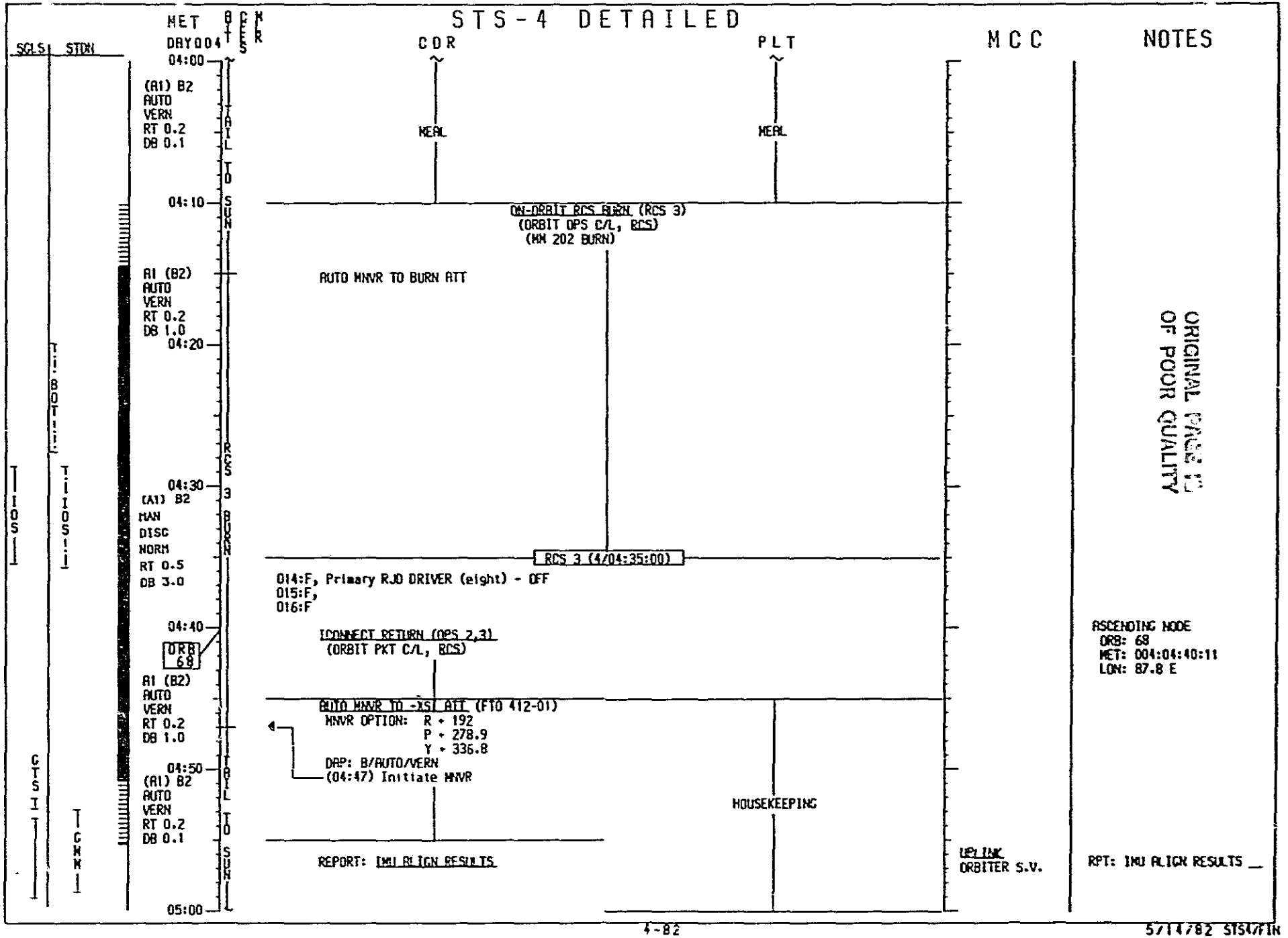

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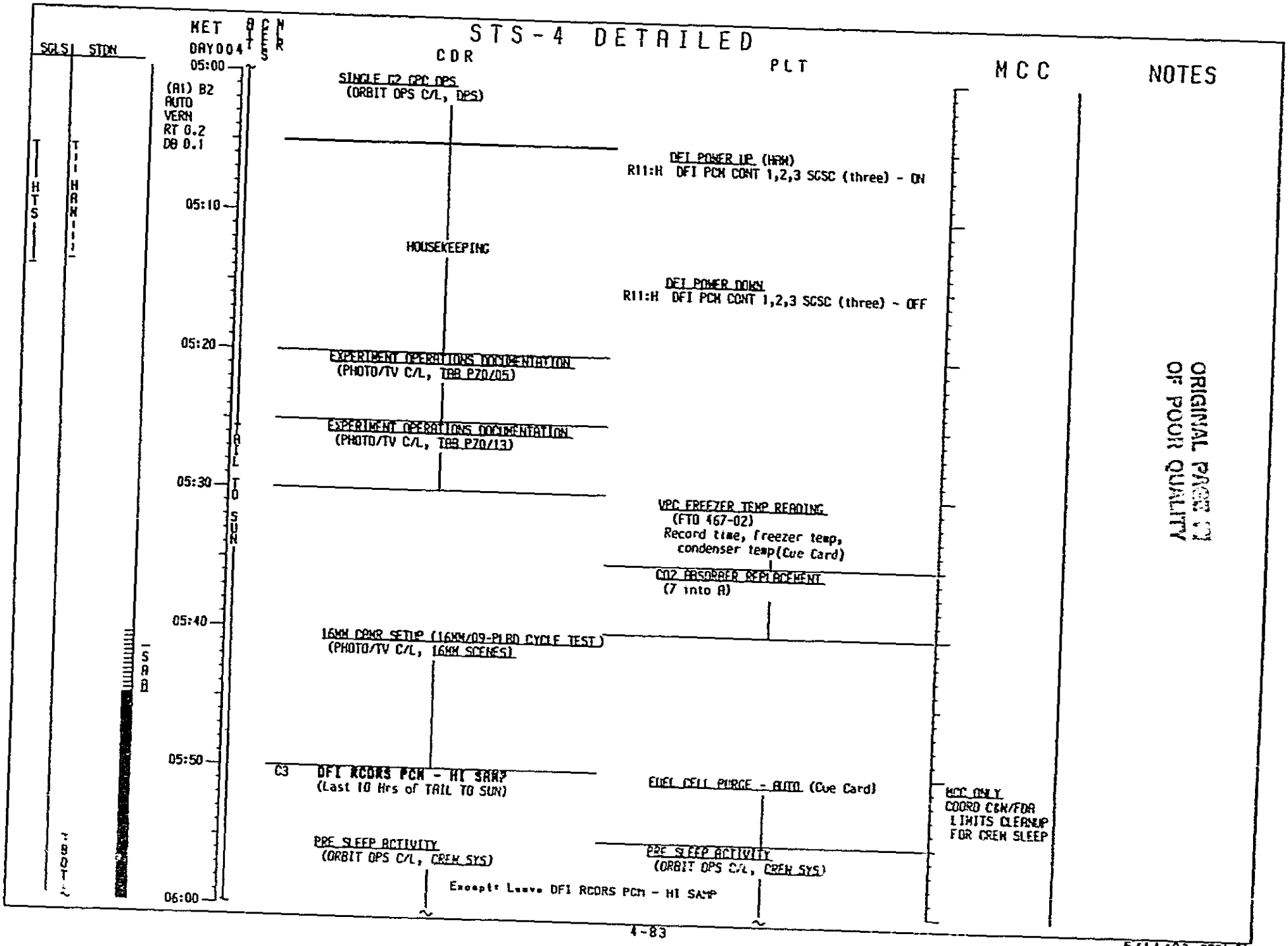
5/14/82 STS4FIN

STS-4 DETAILED



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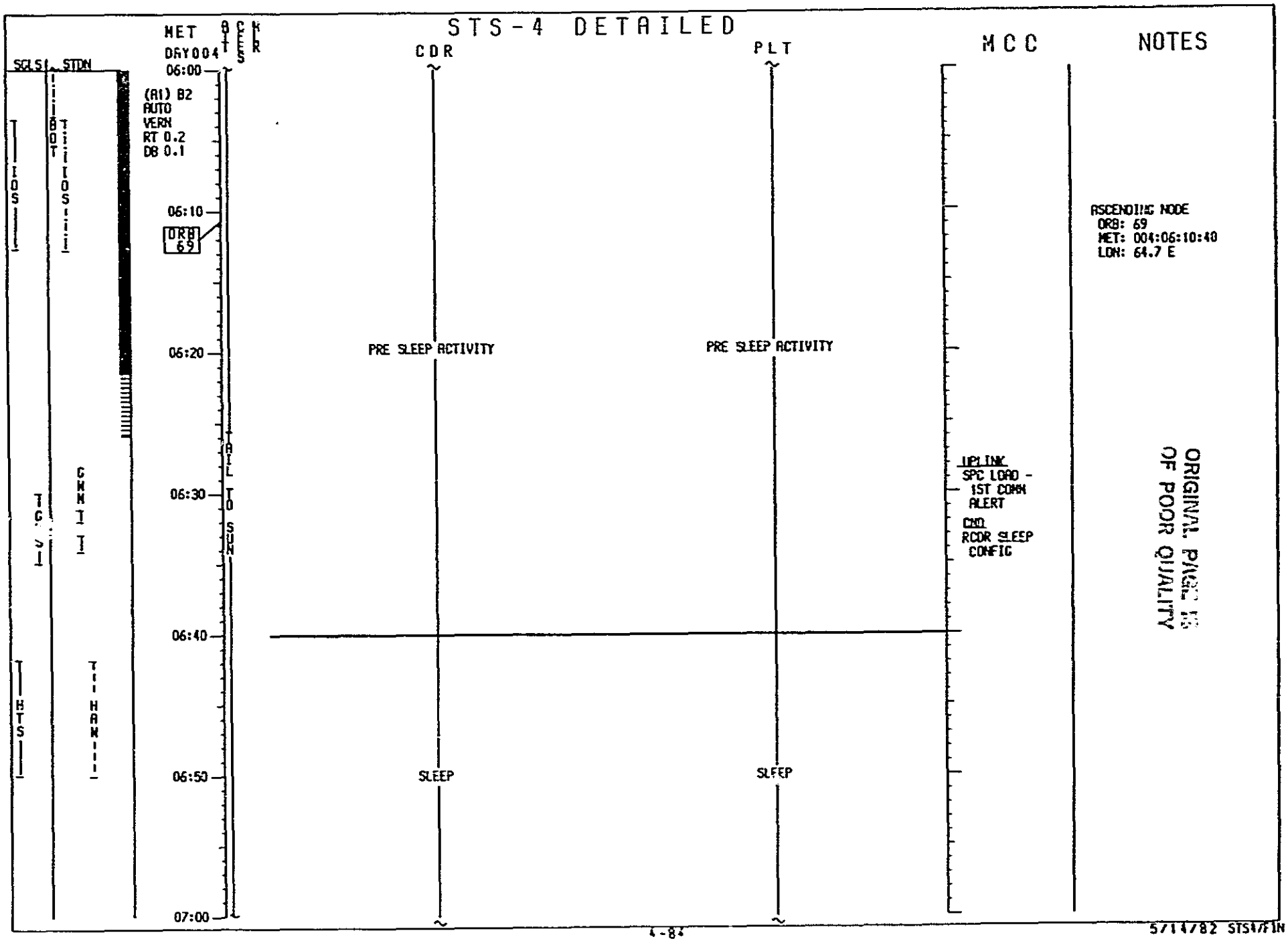
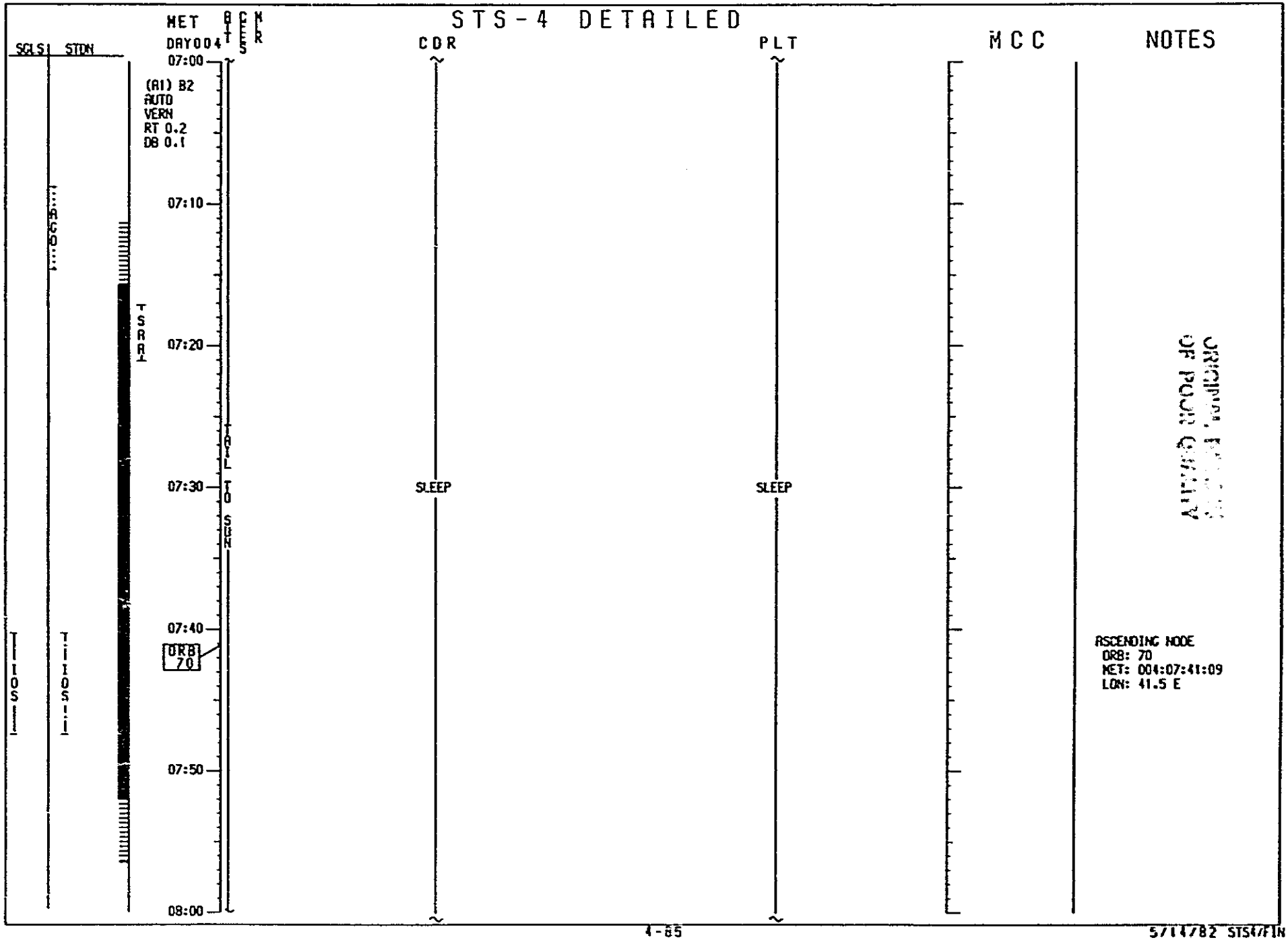
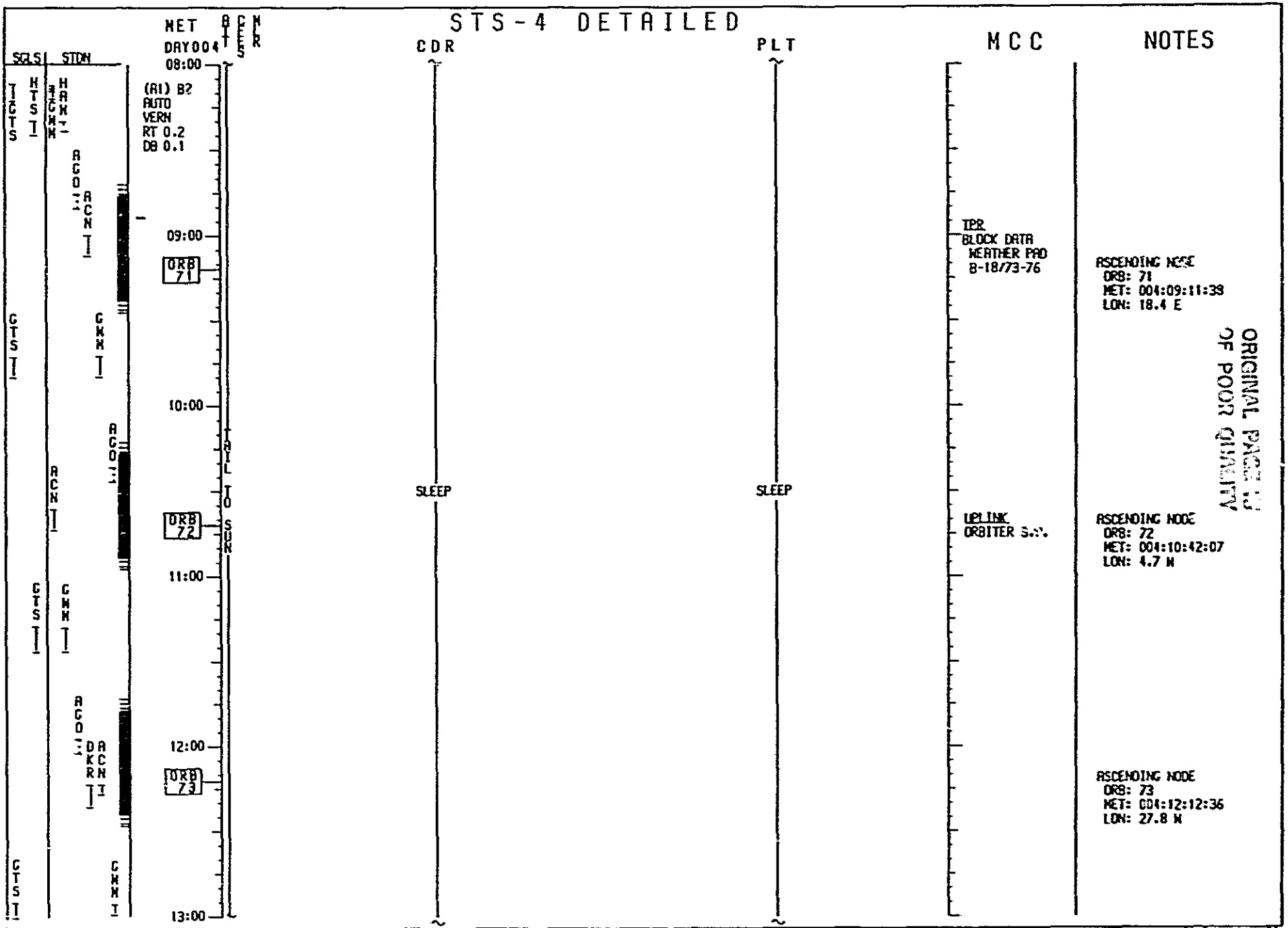
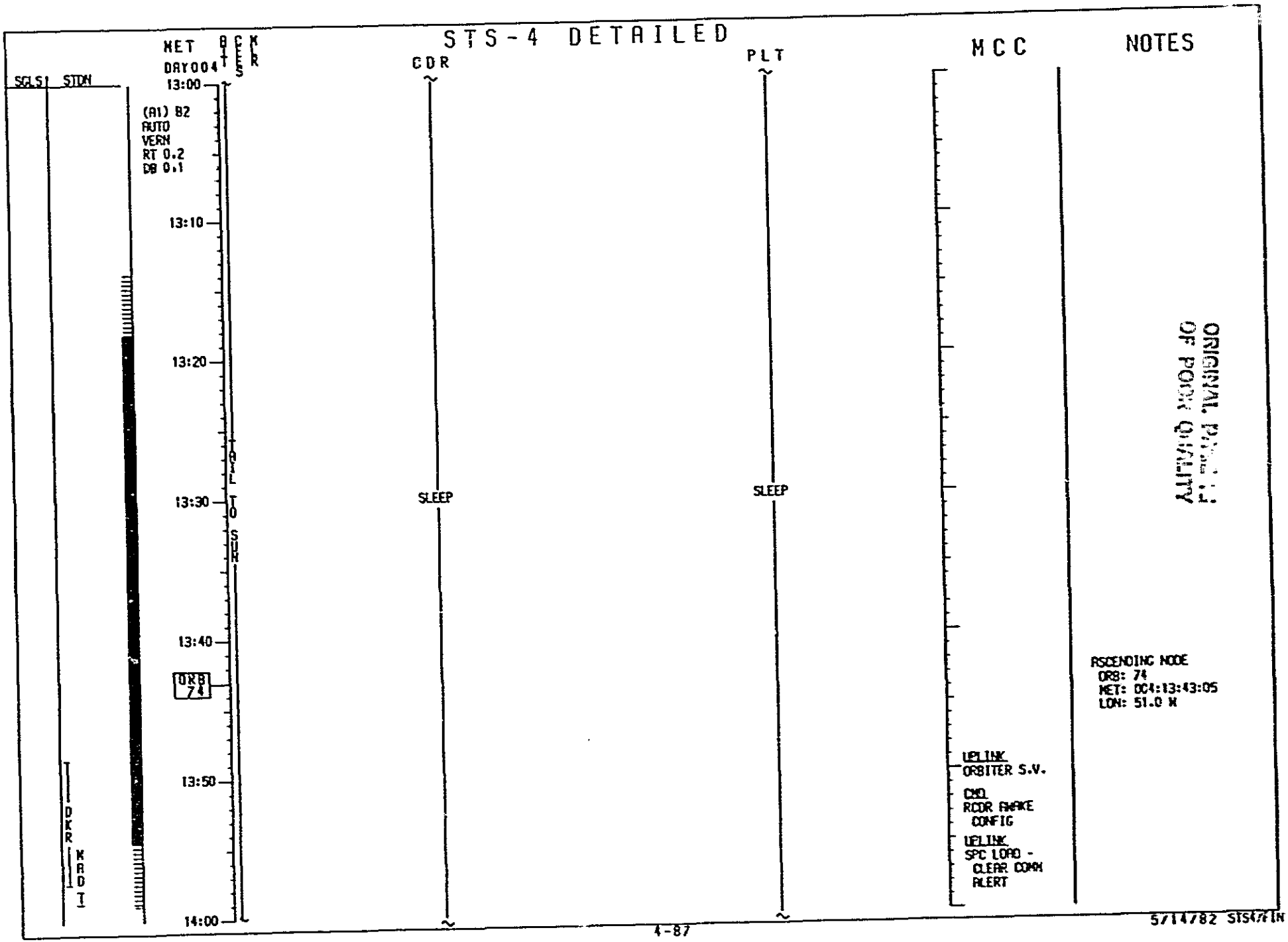
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 004
06:00
06:10
06:20
06:30
06:40
06:50
07:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 69
AOS
LOS
SGLS
STDN
BOT
TILOS
GNTI
TI HAWAII
TGT
HTS
AIL TO SUN
CDR
PRE SLEEP ACTIVITY
SLEEP
PLT
PRE SLEEP ACTIVITY
SLEEP
MCC
UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG
NOTES
ASCENDING NODE
ORB: 69
MET: 004:06:10:40
LON: 64.7 E
ORIGINAL PAGE IS
OF POOR QUALITY
5/14/82 STS4/FIN

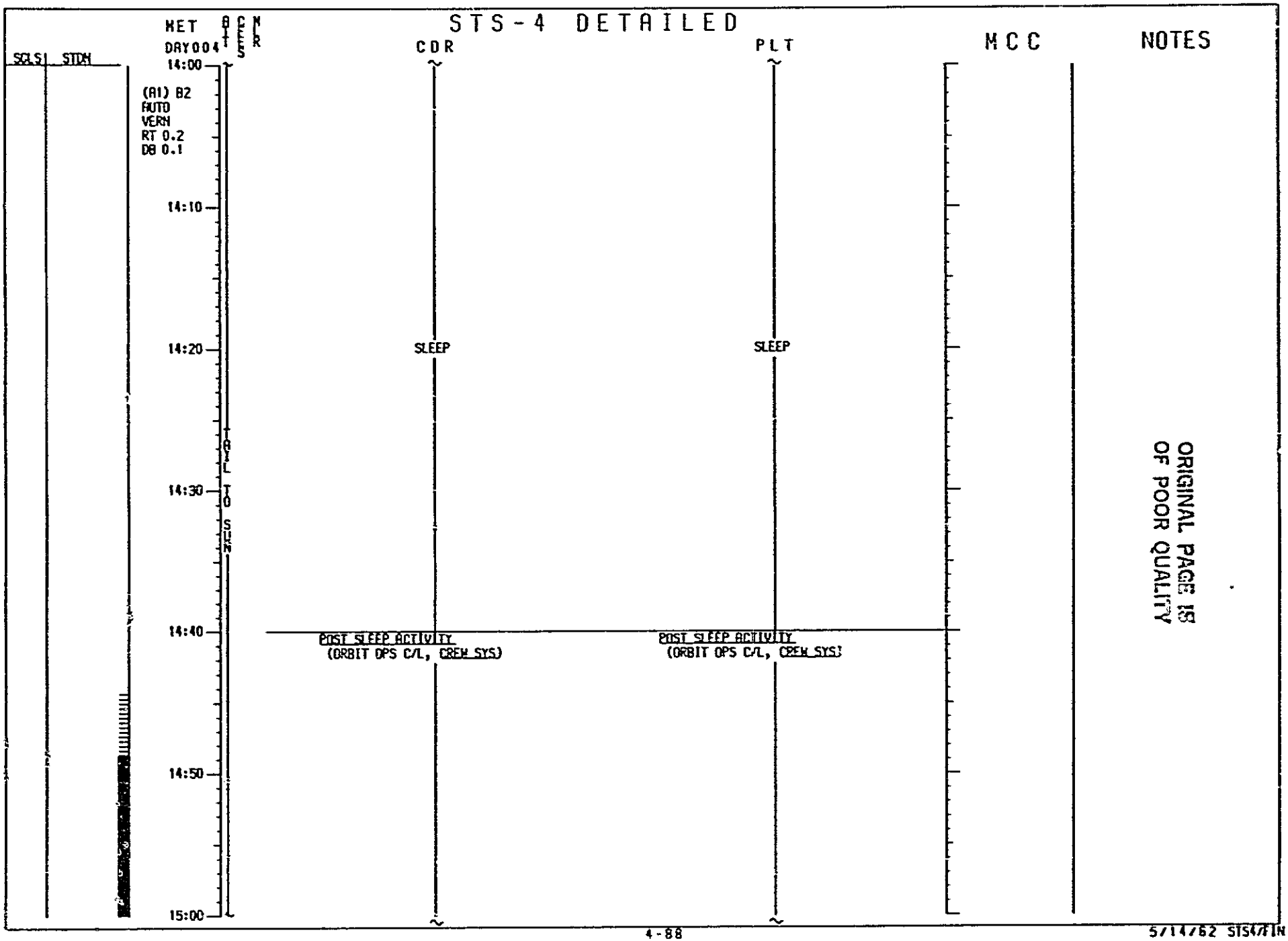

STS-4 DETAILED
MET
DAY004
SGLS
STDN
ACTS
MKR
07:00
07:10
07:20
07:30
07:40
07:50
08:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
TSRA
ACTS TO SHUTTLE
ORB 70
TDRS-I
TDRS-I
CDR
PLT
MCC
NOTES
SLEEP
SLEEP
ASCENDING NODE
ORB: 70
MET: 004:07:41:09
LON: 41.5 E

STS-4 DETAILED

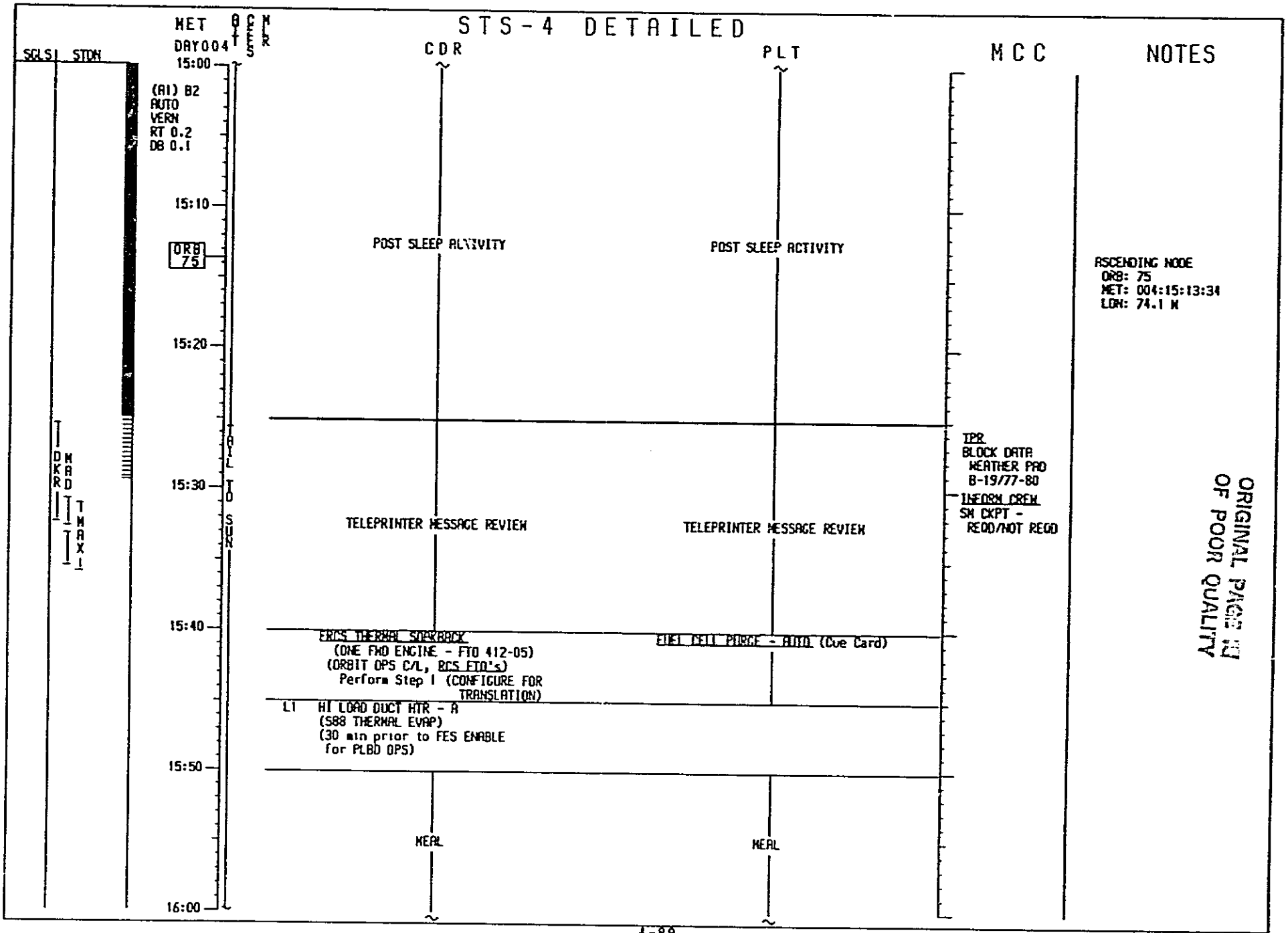

MET
DAY004
08:00
09:00
10:00
11:00
12:00
13:00
SQLS
STDN
TICTS
HTST
HACKK
ACN
GTS
GNK
DKR
ACN
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 71
ORB 72
ORB 73
ACN
GNK
ACN
GTS
GNK
ACN
DKR
ACN
GTS
GNK
ACN
GTS
ACN
GNK
ACN
GTS
ACN
GNK
ACN
GTS
ACN


STS-4 DETAILED
MET
DAY004
SGLS
STDN
13:00
13:10
13:20
13:30
13:40
13:50
14:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 74
DKR
TDRS
KRDT
CDR
SLEEP
PLT
SLEEP
MCC
NOTES
UPLINK
ORBITER S.V.
CMD
RCDR AWAKE
CONFIG
UPLINK
SPC LOAD -
CLEAR COMM
ALERT
ASCENDING NODE
ORB: 74
MET: 004:13:43:05
LON: 51.0 W
ORIGINAL PAGE IS
OF POOR QUALITY
4-87
5/14782 SIS4/1N

FLT DAY 6

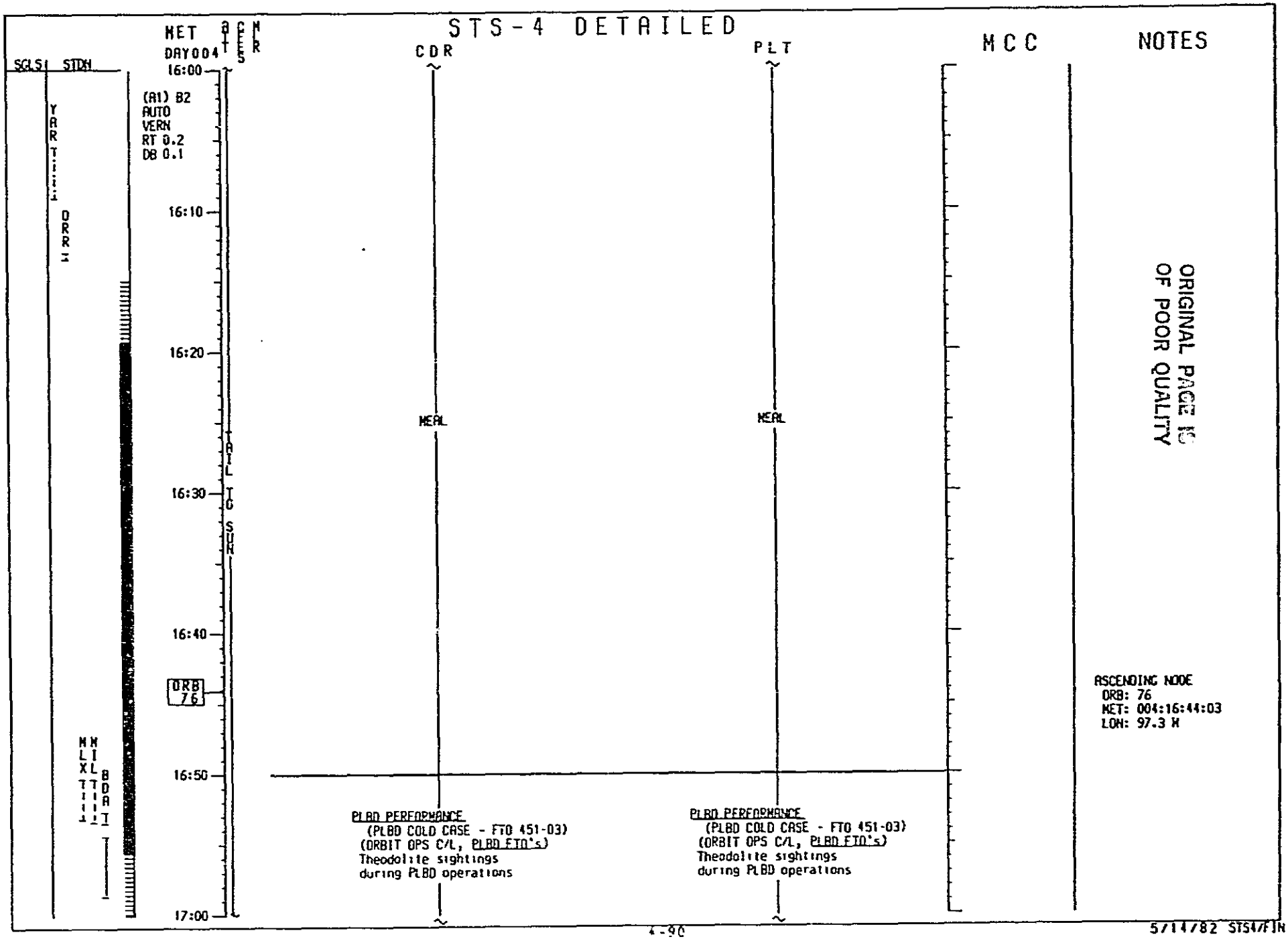

STS-4 DETAILED
MET
DAY004
SCLS
STDN
ACES
MCR
CDR
PLT
MCC
NOTES
14:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
14:10
14:20
SLEEP
SLEEP
14:30
AFT TO STBD
14:40
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
14:50
15:00
ORIGINAL PAGE IS
OF POOR QUALITY
4-88
5/14/82 STS4/7IN

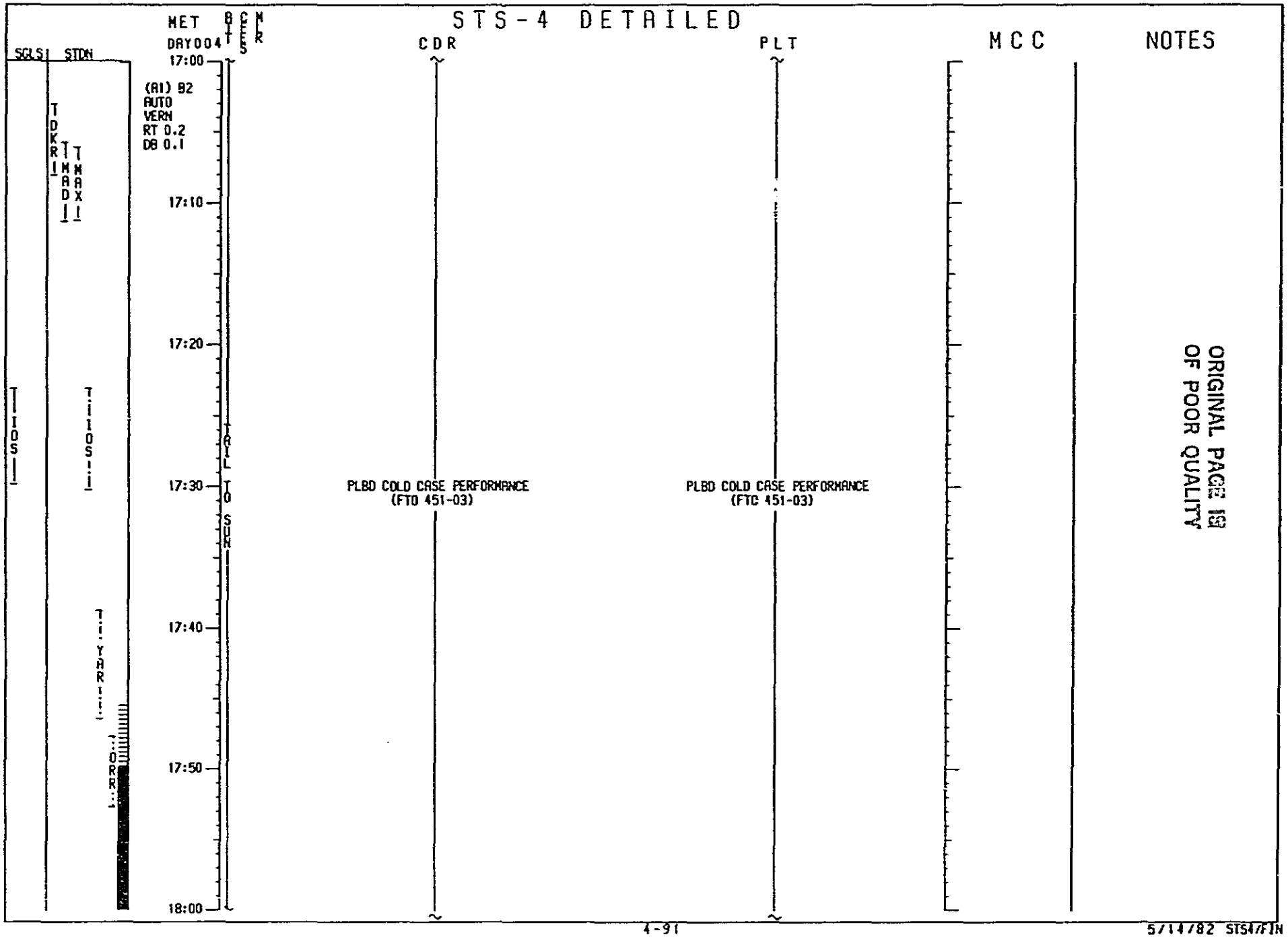
STS-4 DETAILED



ORIGINAL PAGE IS OF POOR QUALITY

5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 004
SGLS
STDN
ACES
MR
CDR
PLT
MCC
NOTES
16:00
16:10
16:20
16:30
16:40
16:50
17:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
YAR TIRA DRR
MXL TDRA
AIL TG SSR
MEAL
MEAL
ORB 76
PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations
PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations
ASCENDING NODE
ORB: 76
MET: 004:16:44:03
LON: 97.3 W
ORIGINAL PAGE IS
OF POOR QUALITY
5/14/82 STS4/FIN



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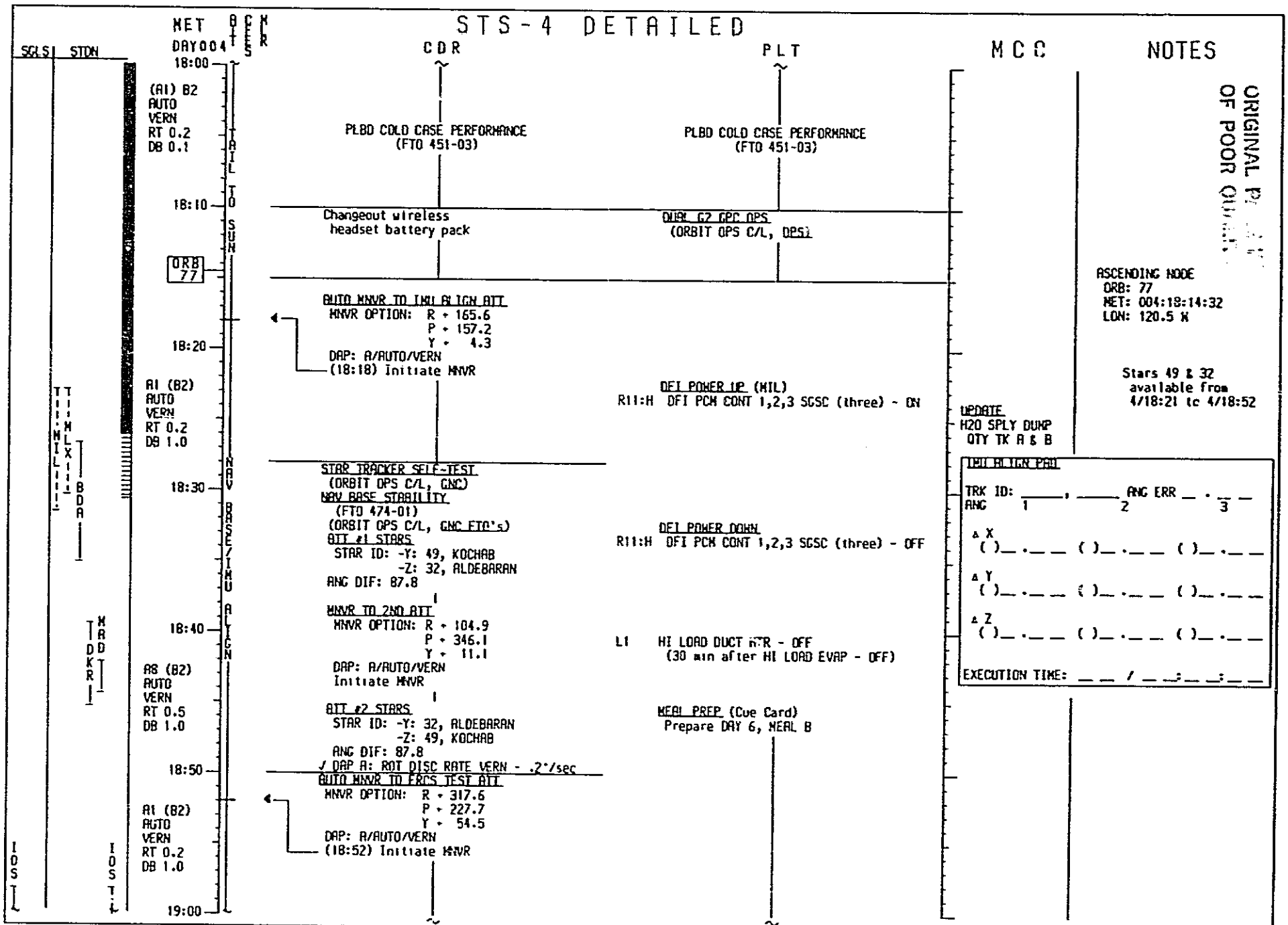
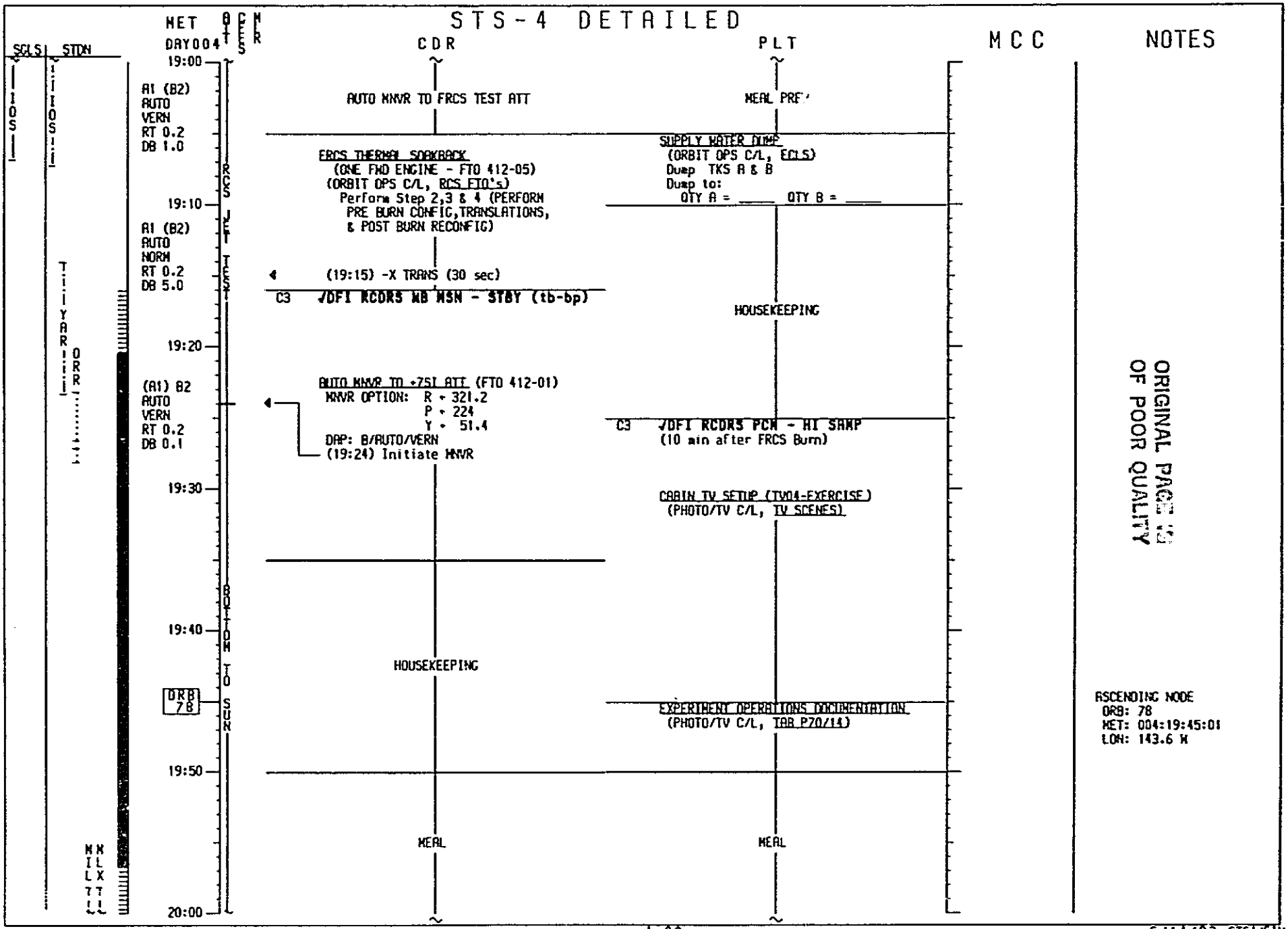
5/14/82 STS4/FIN

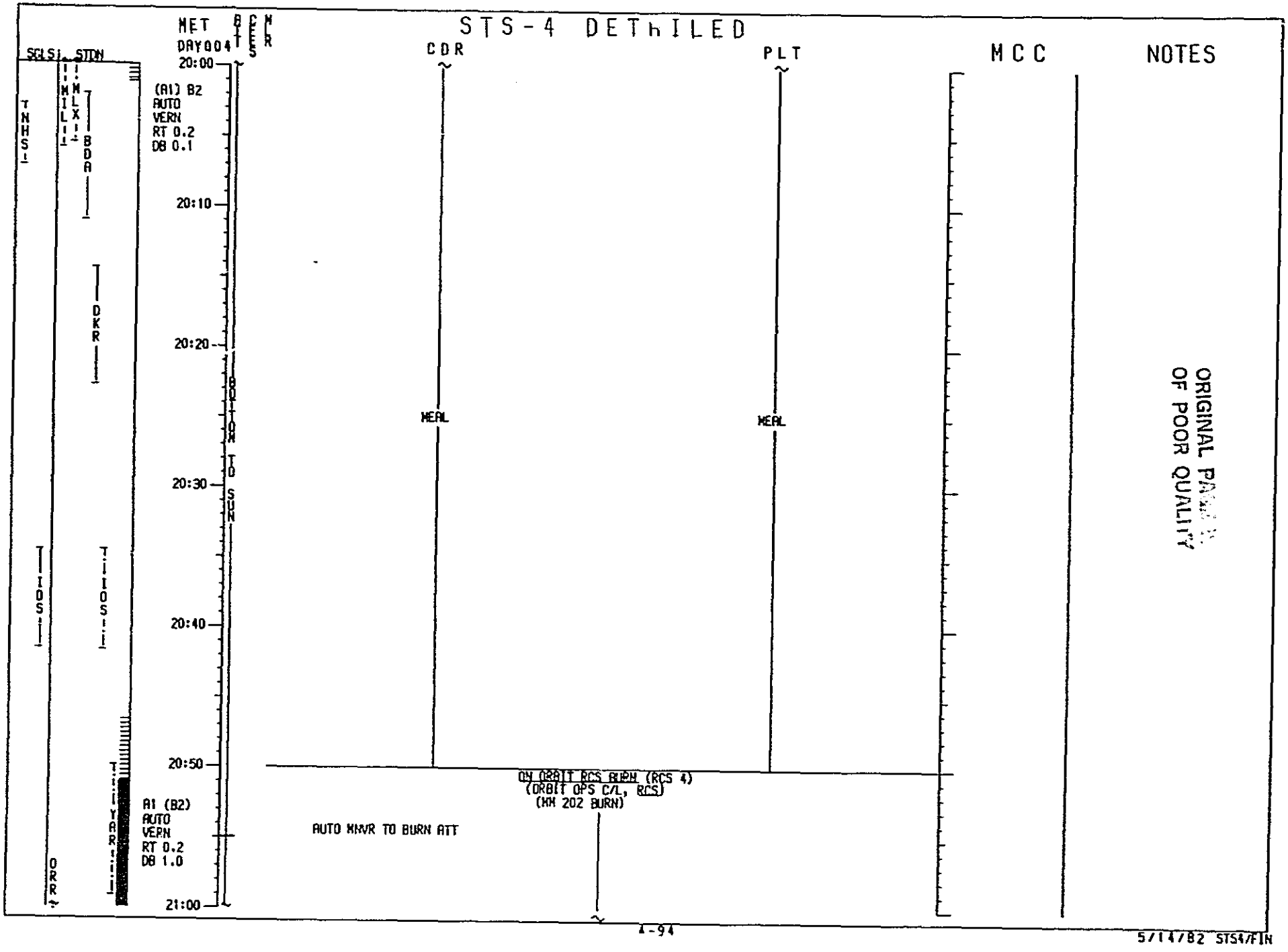
STS-4 DETAILED

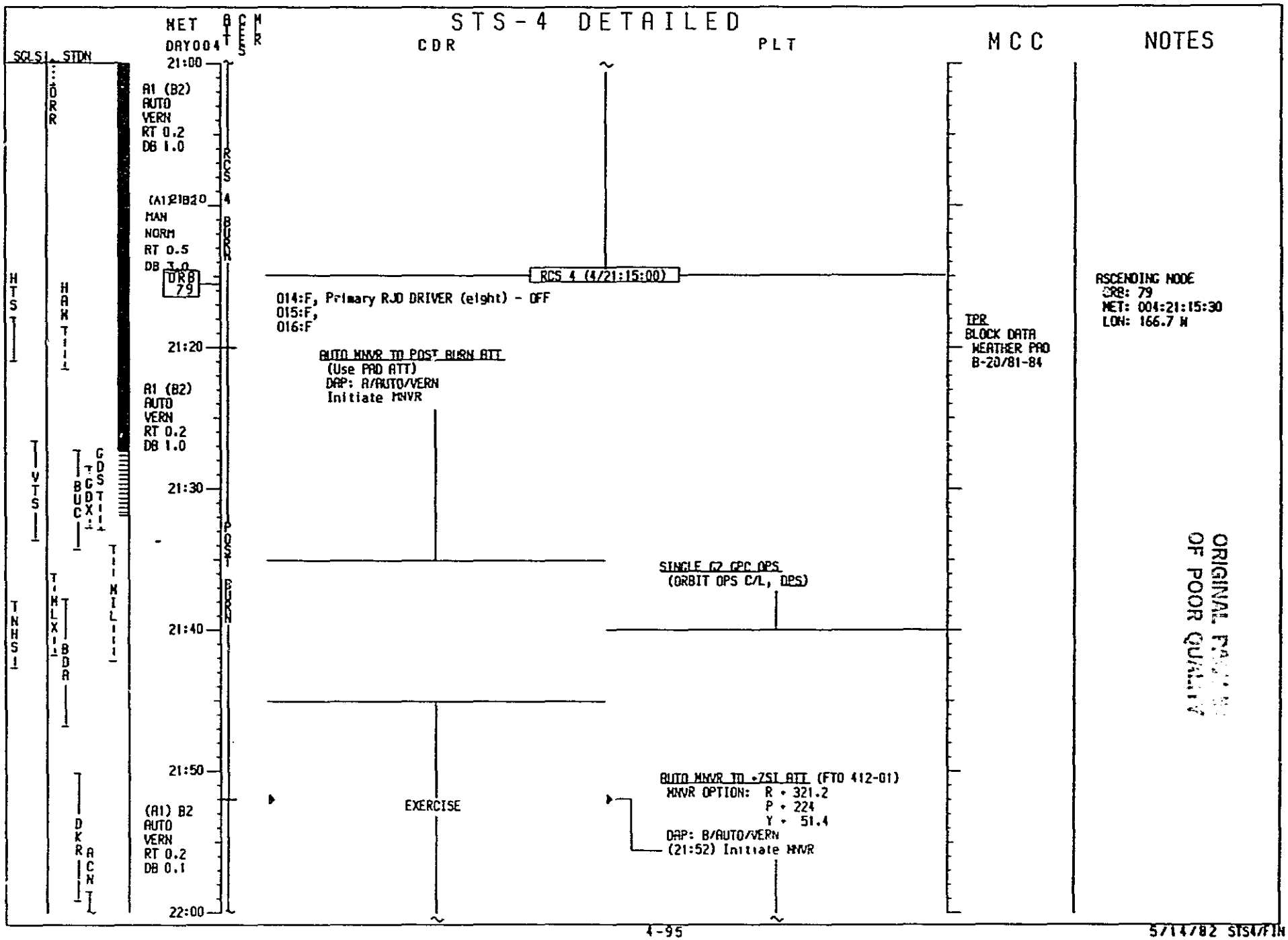


STS-4 DETAILED



5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY 004
SGLS
STDN
TDRS
CDR
PLT
MCC
NOTES
20:00
20:10
20:20
20:30
20:40
20:50
21:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
MEAL
MEAL
ON ORBIT RCS BURN (RCS 4)
(ORBIT OPS C/L, RCS)
(MM 202 BURN)
AUTO MNVR TO BURN ATT
TNHSI
MILA
MLXI
BDA
DKR
BOX
TO SUN
TIOSI
TIOSI
TIVRI
ORR
ORIGINAL PAGE IS
OF POOR QUALITY
A-94
5/14/82 STS4/FIN



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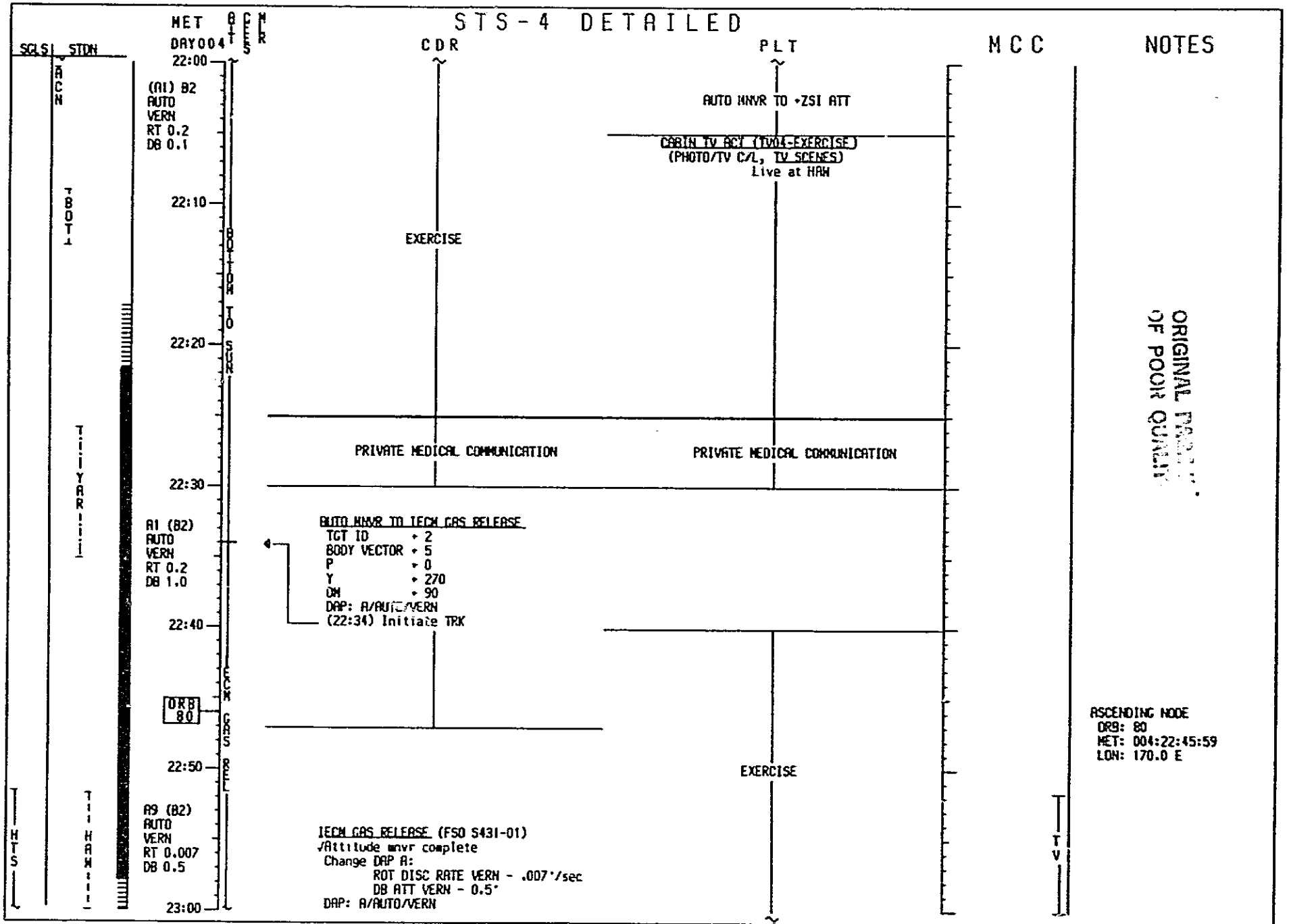
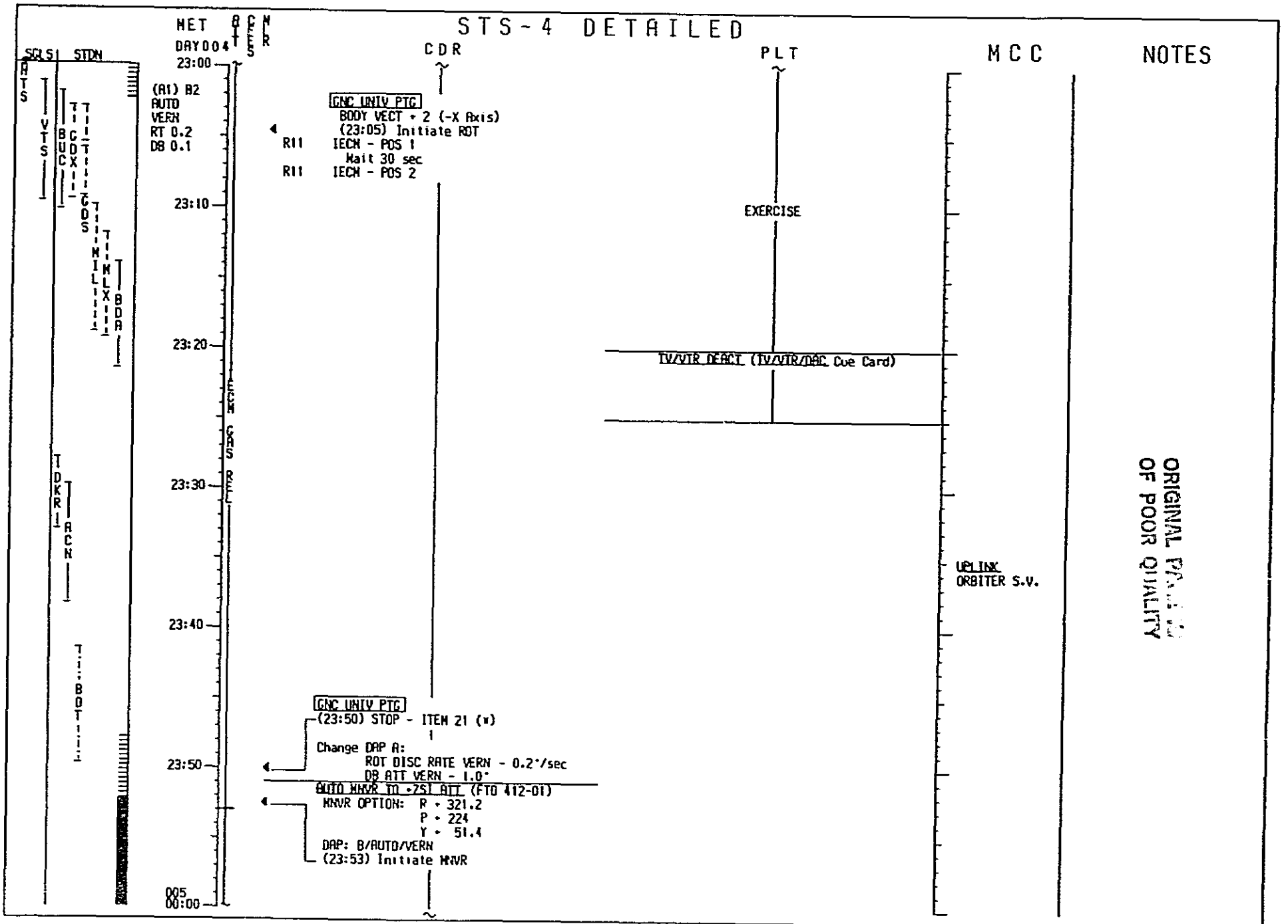
5/14/82 STS4/FIN

STS-4 DETAILED



5/14/82 STS4/FIN

STS-4 DETAILED



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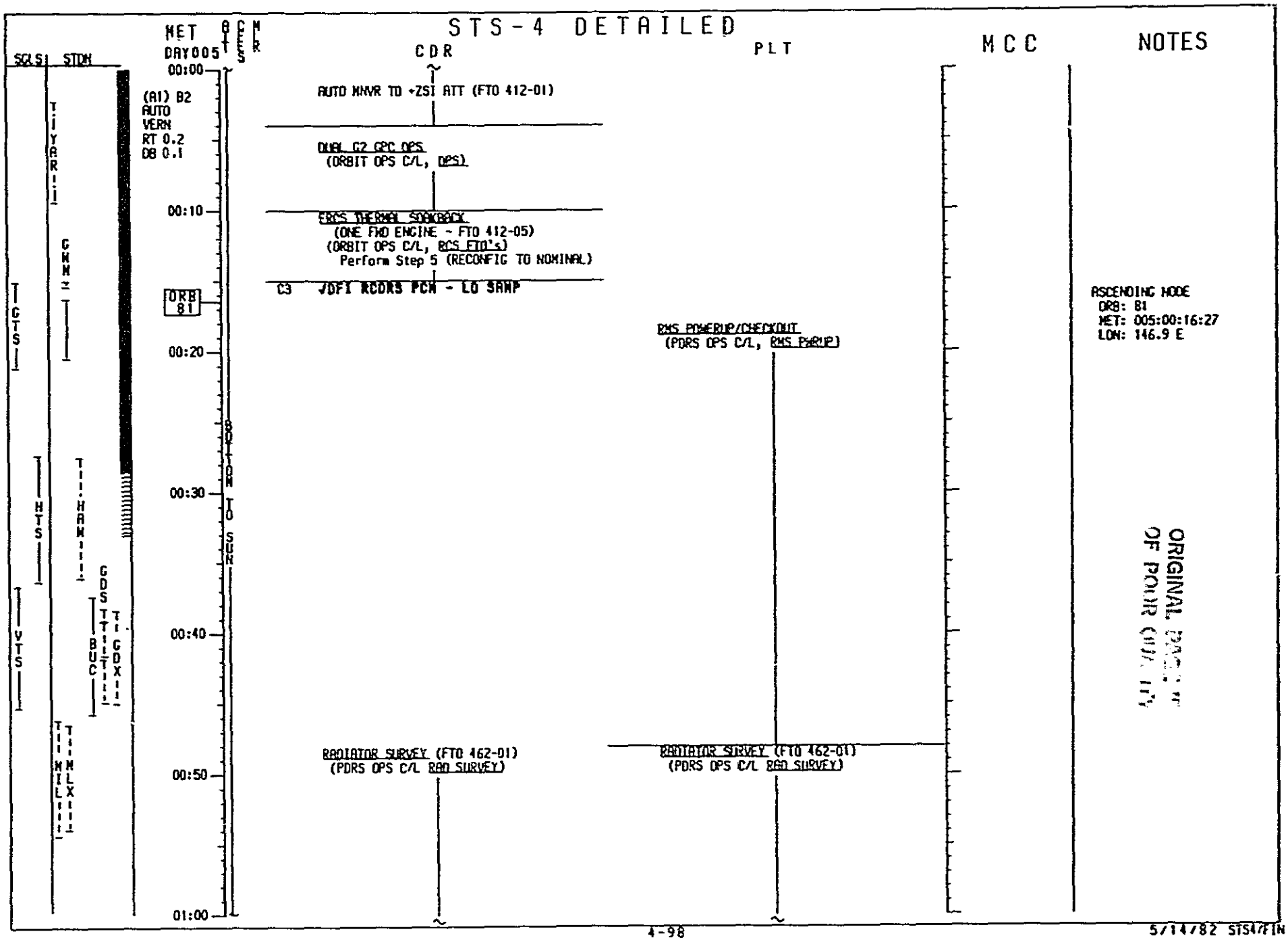
OF POOR QUALITY

STS-4 DETAILED



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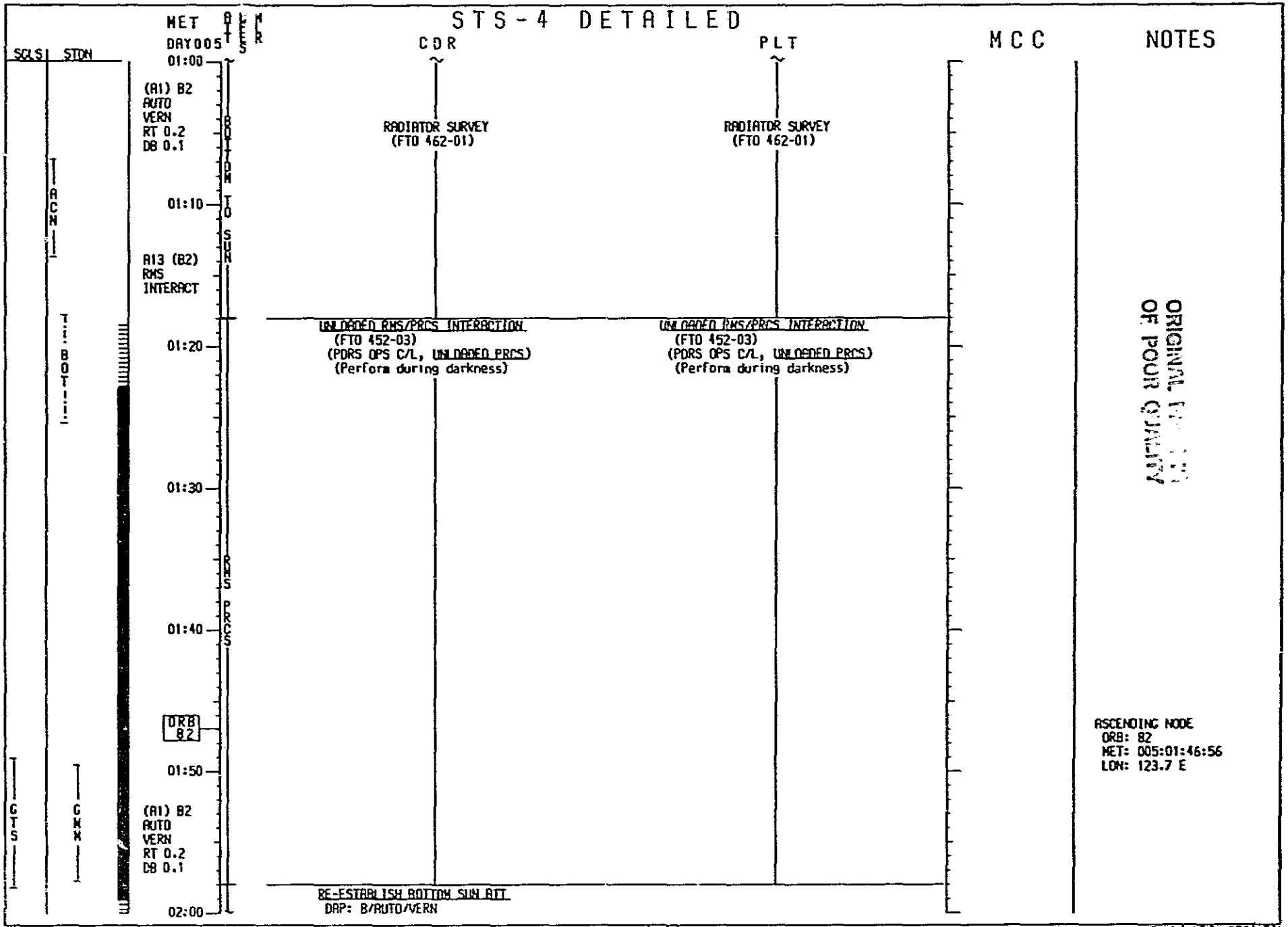
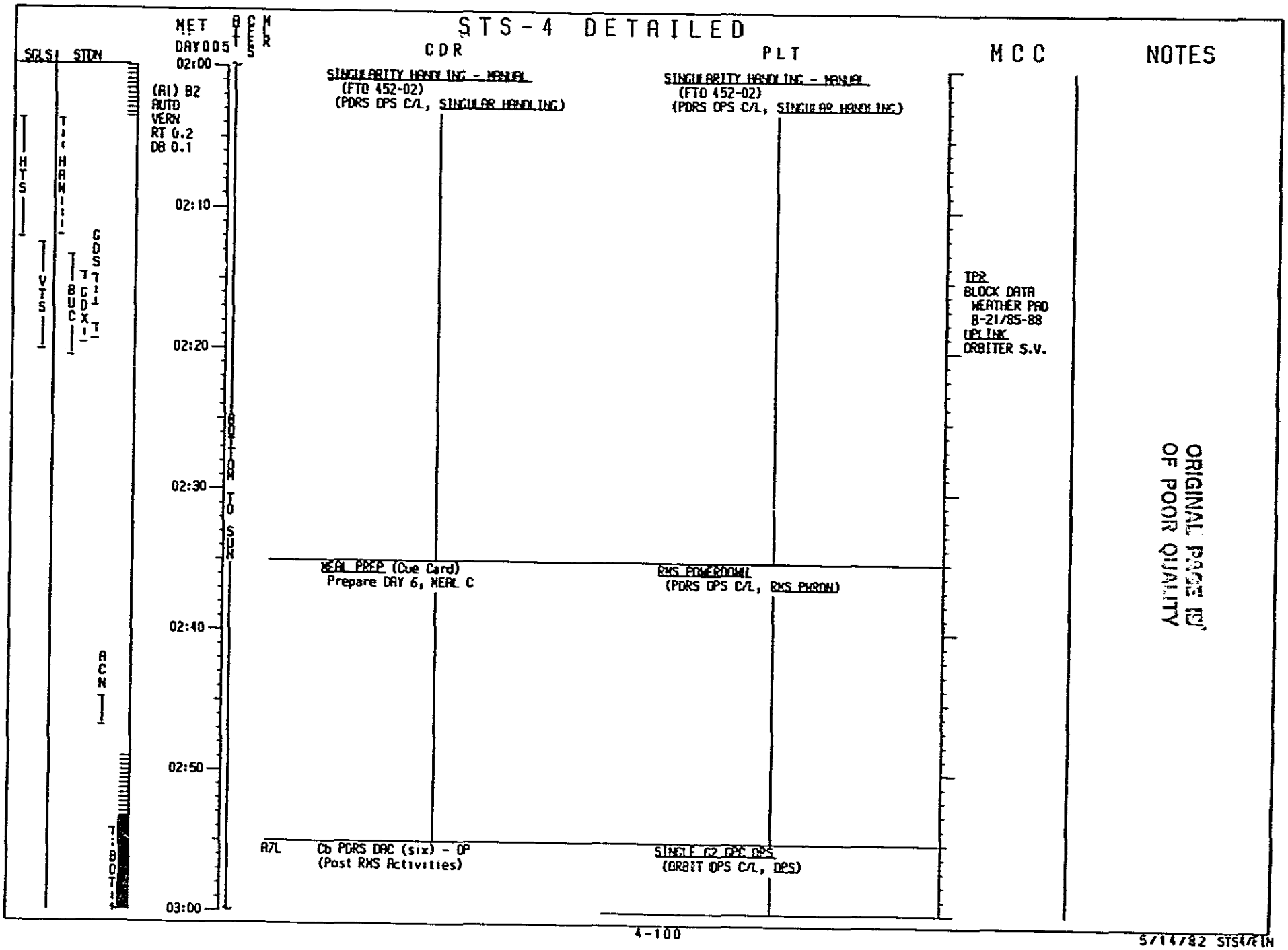
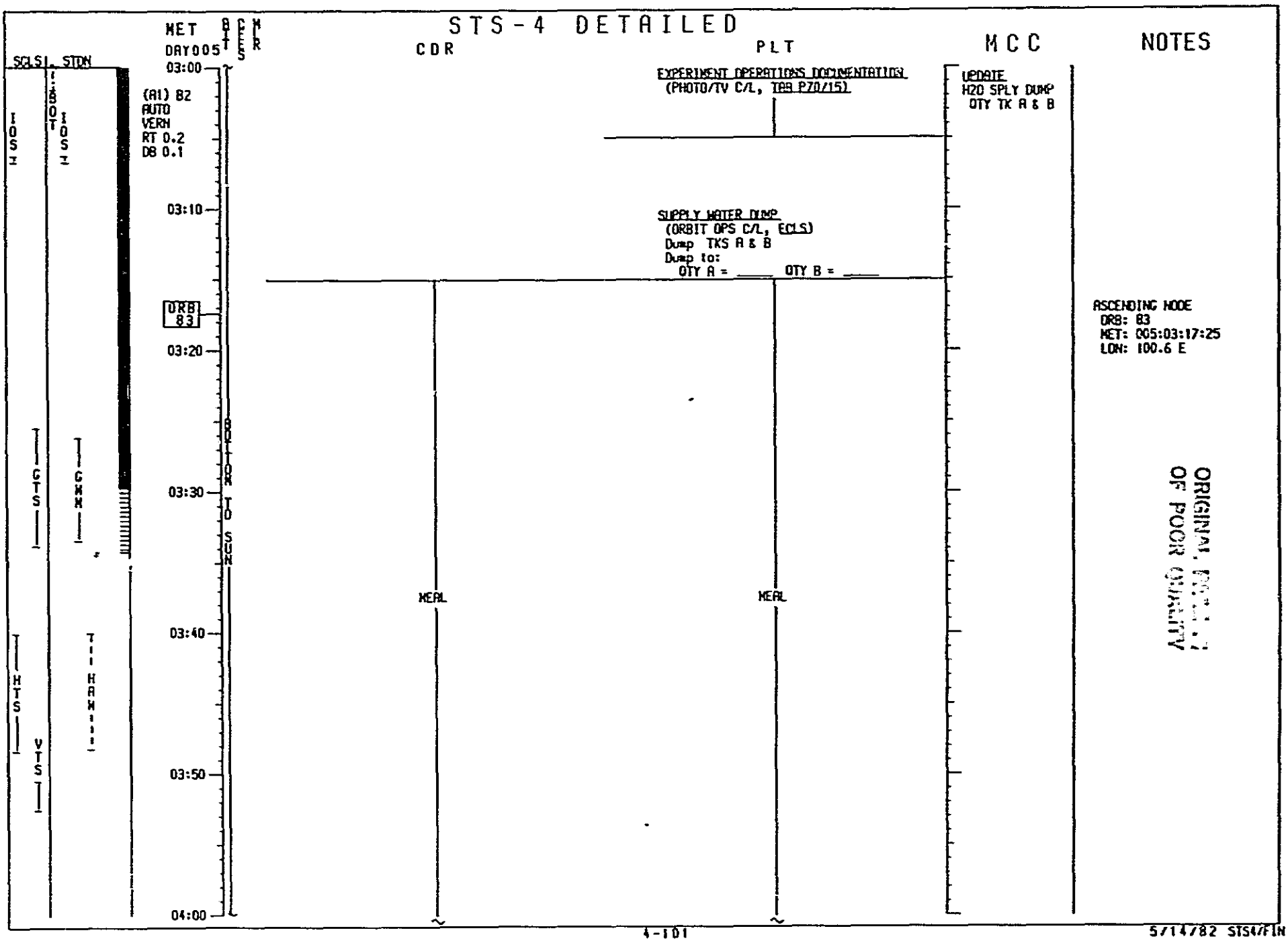
OF POOR QUALITY

STS-4 DETAILED

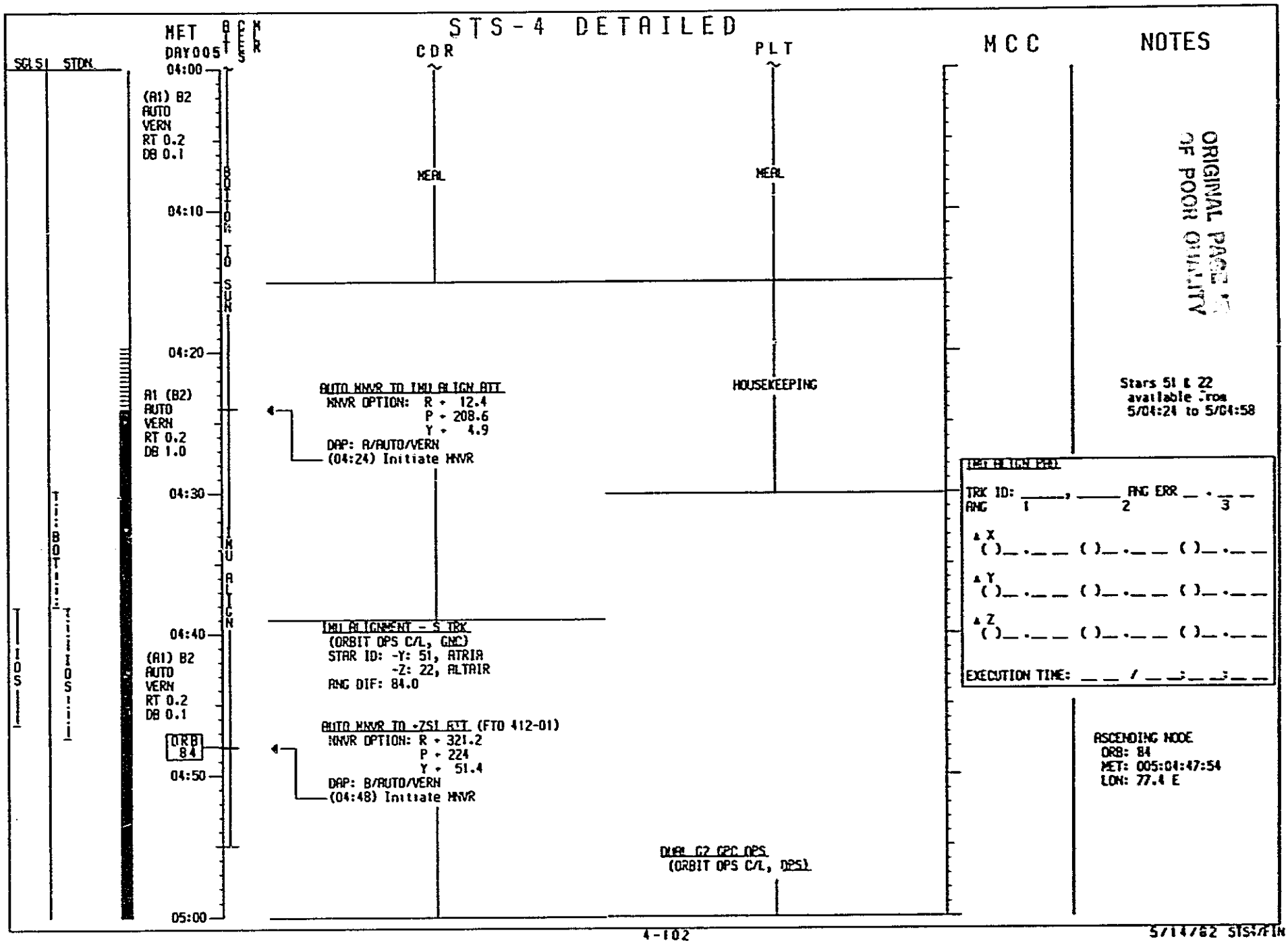




5/14/82 STS4/EIN


STS-4 DETAILED
MET
DAY 005
CDR
PLT
MCC
NOTES
SGLS, STDN
03:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB PZ0/15)
UPDATE
H2O SPLY DUMP
QTY TK A & B
03:10
SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____
ORB
83
03:20
03:30
03:40
03:50
04:00
MEAL
MEAL
ASCENDING NODE
ORB: 83
MET: 005:03:17:25
LON: 100.6 E
ORIGINAL PAGE IS
OF POOR QUALITY

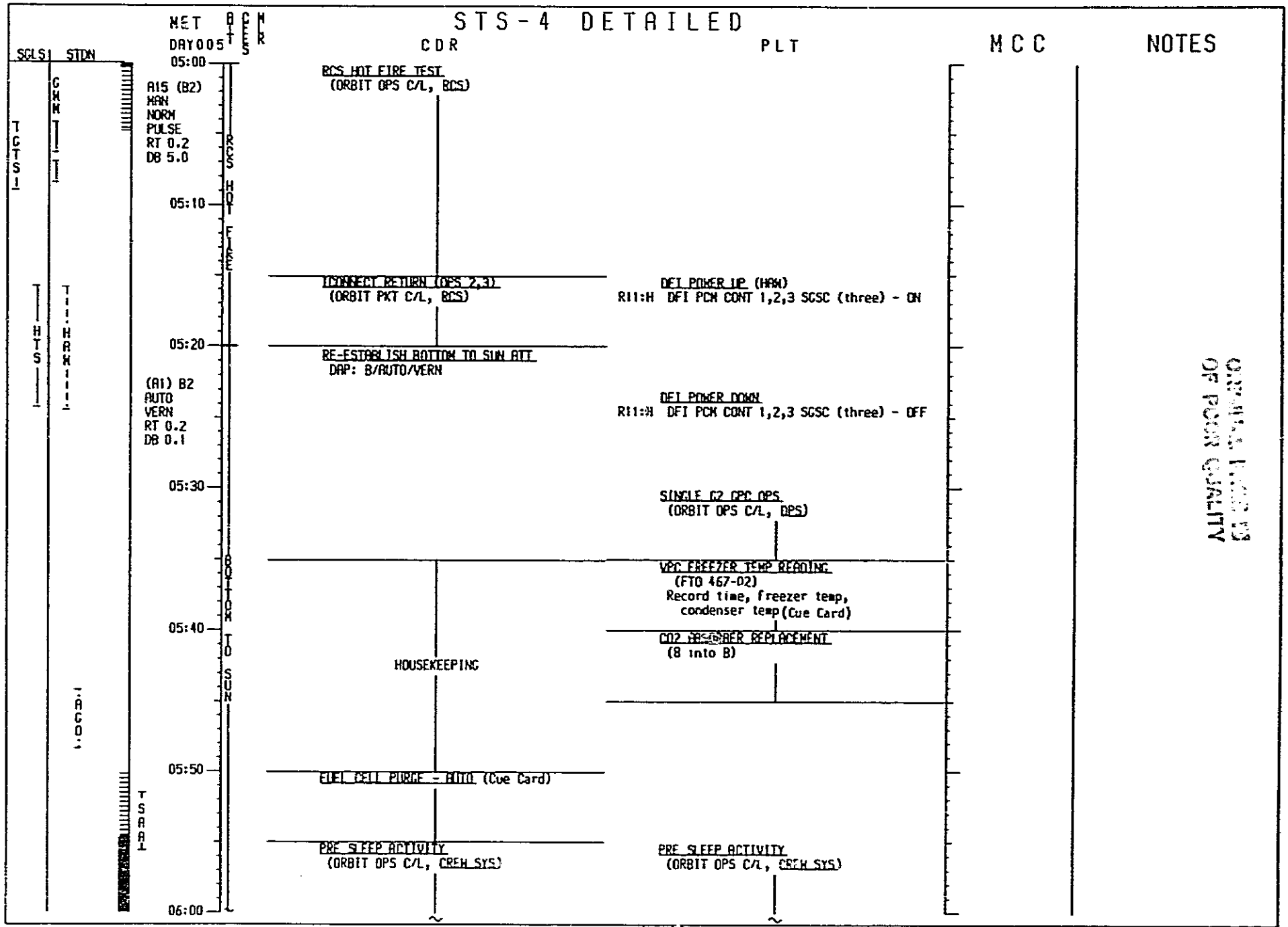
STS-4 DETAILED



ORIGINAL PAGE IS
OF POOR QUALITY

5/14/82 STS/FIN

STS-4 DETAILED



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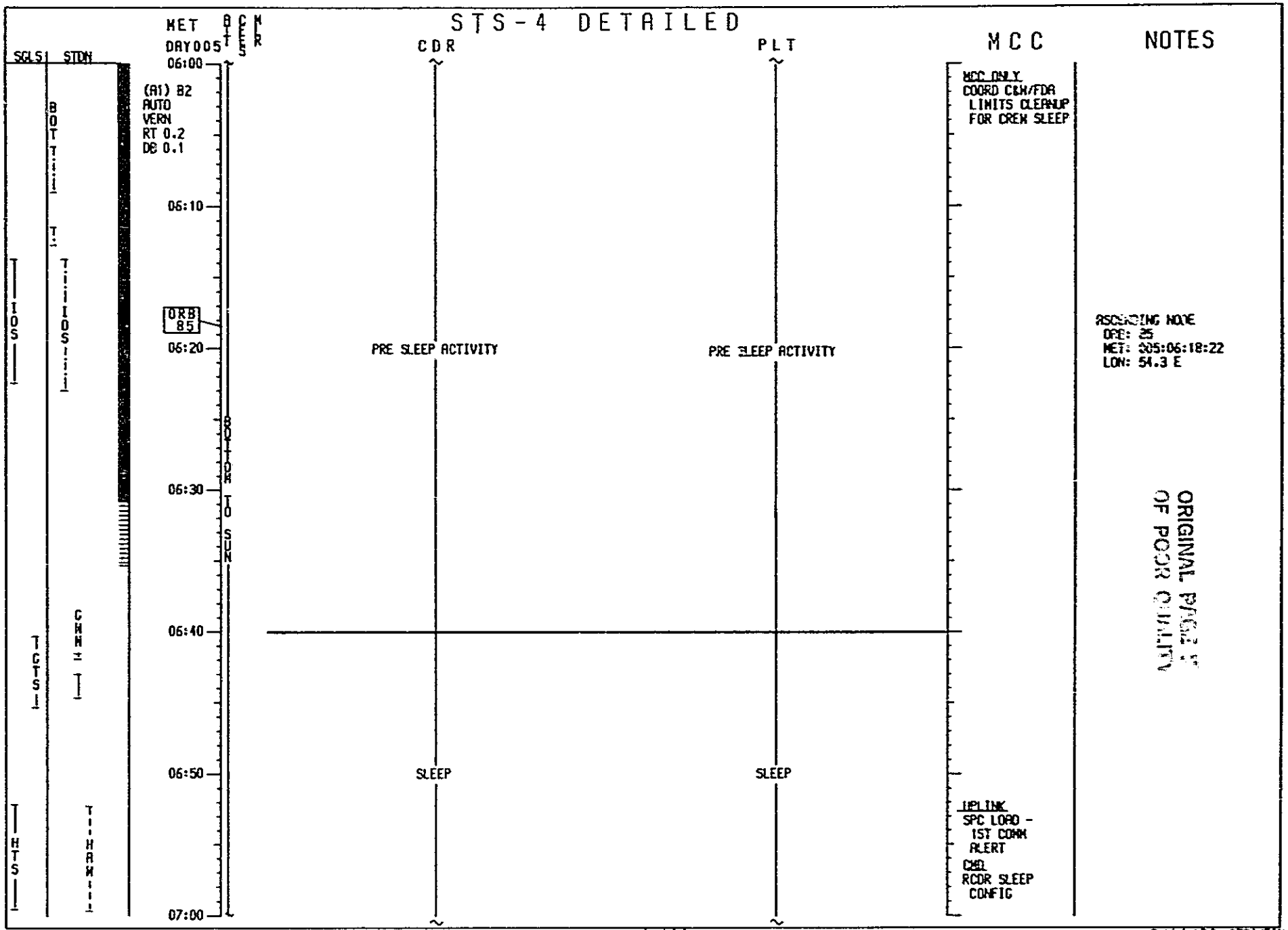
STS-4 DETAILED



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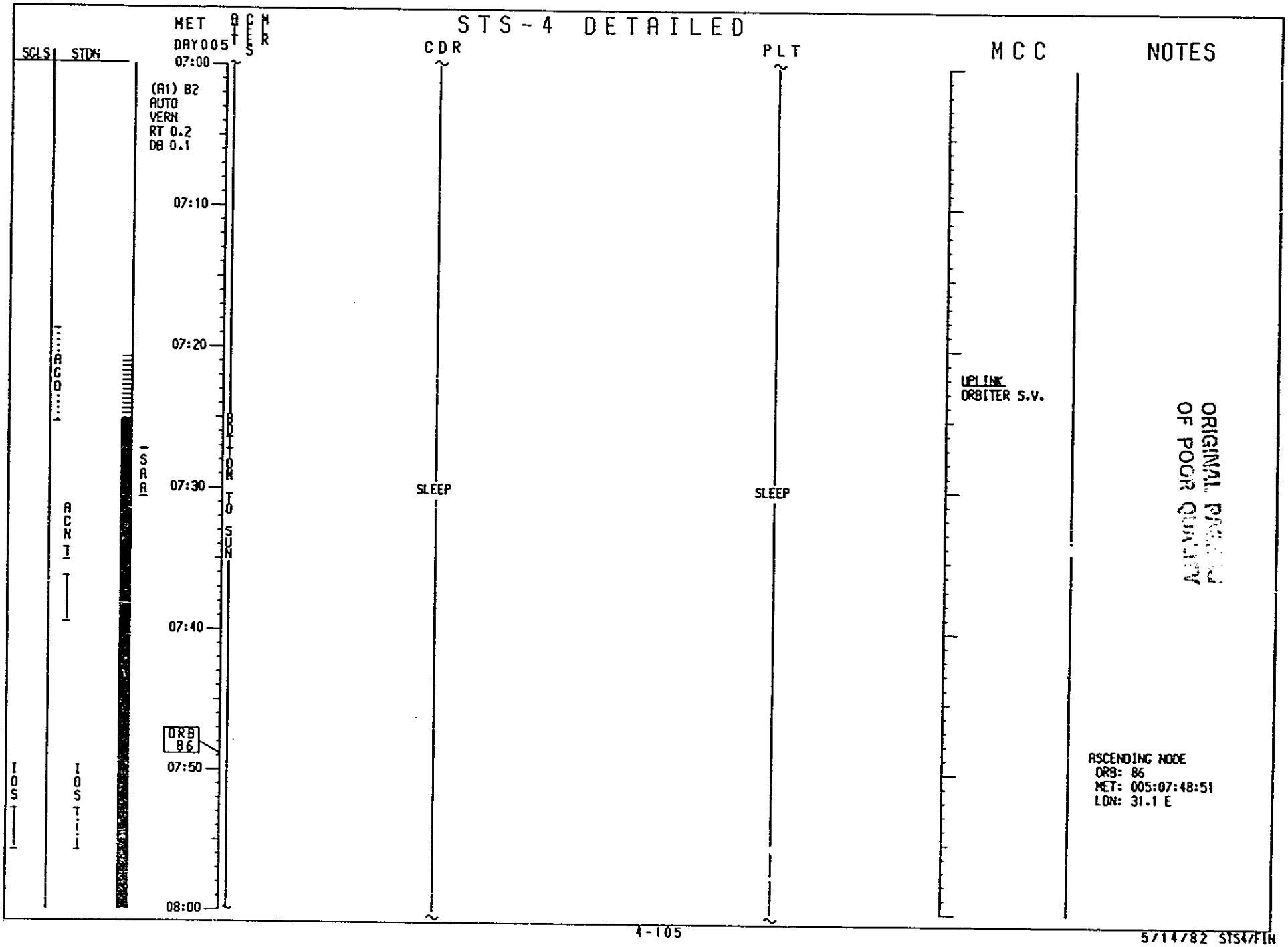

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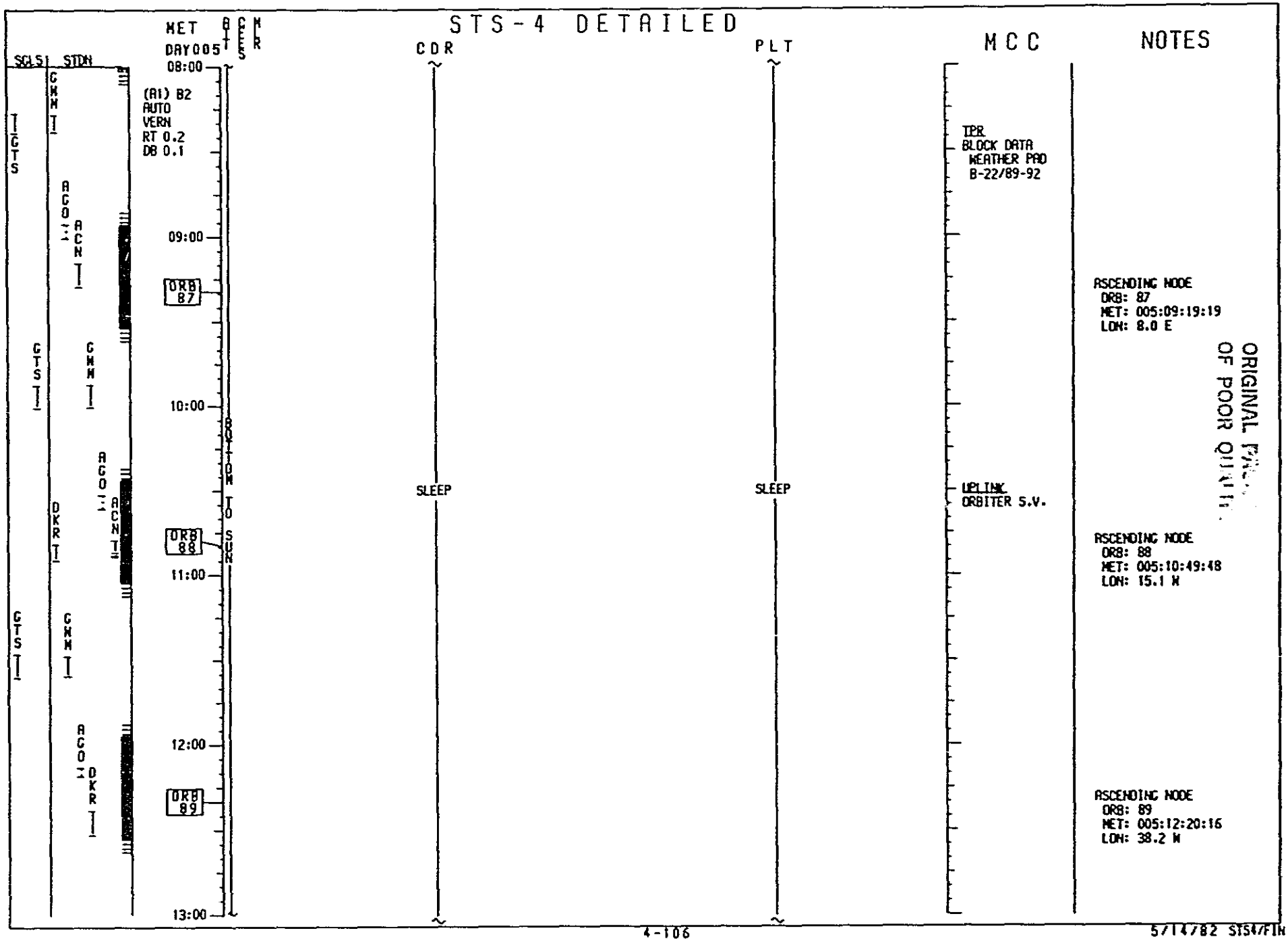
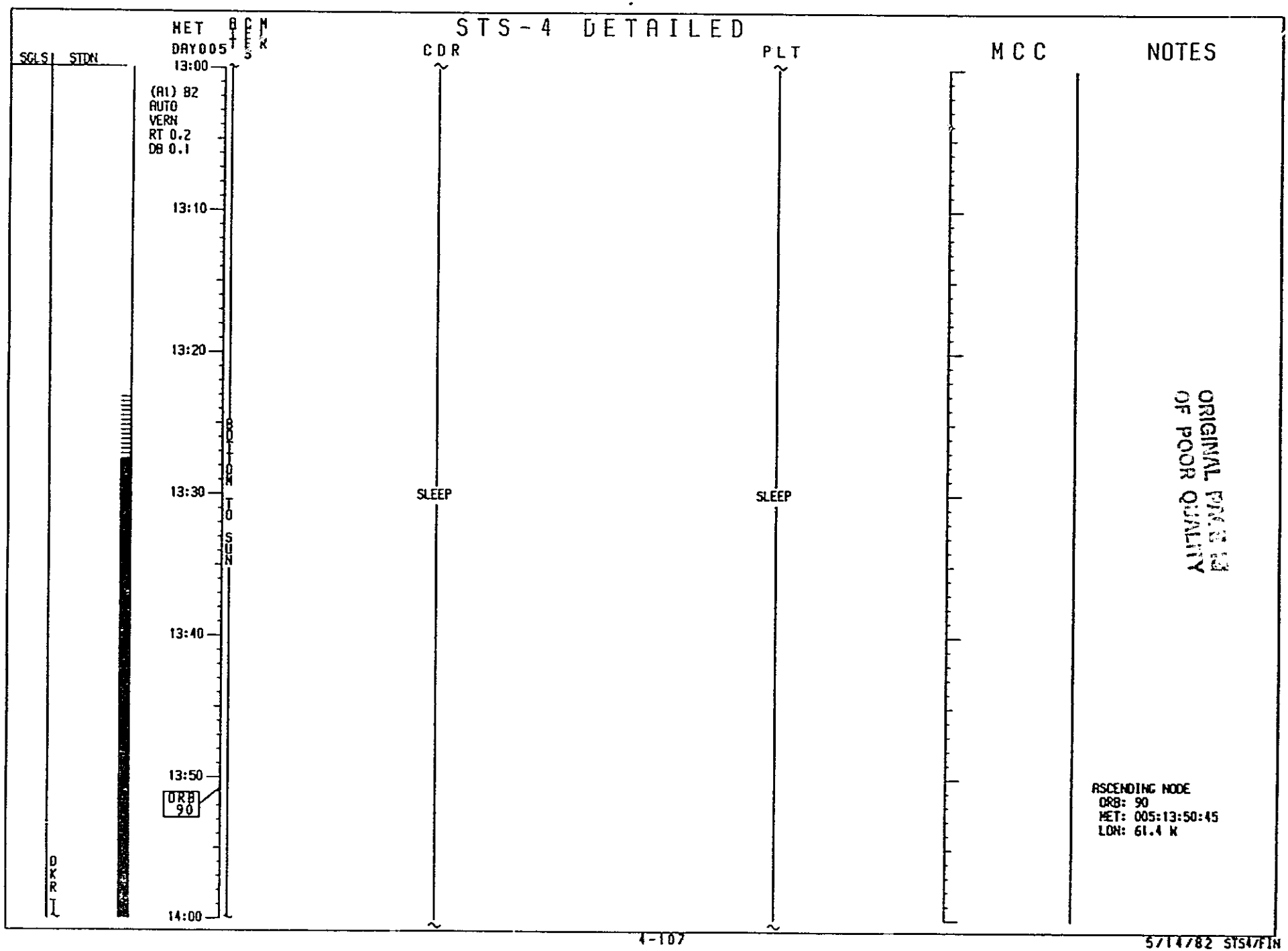
5/14/82 STS4/FIN



5/14/82 STS4/FIN



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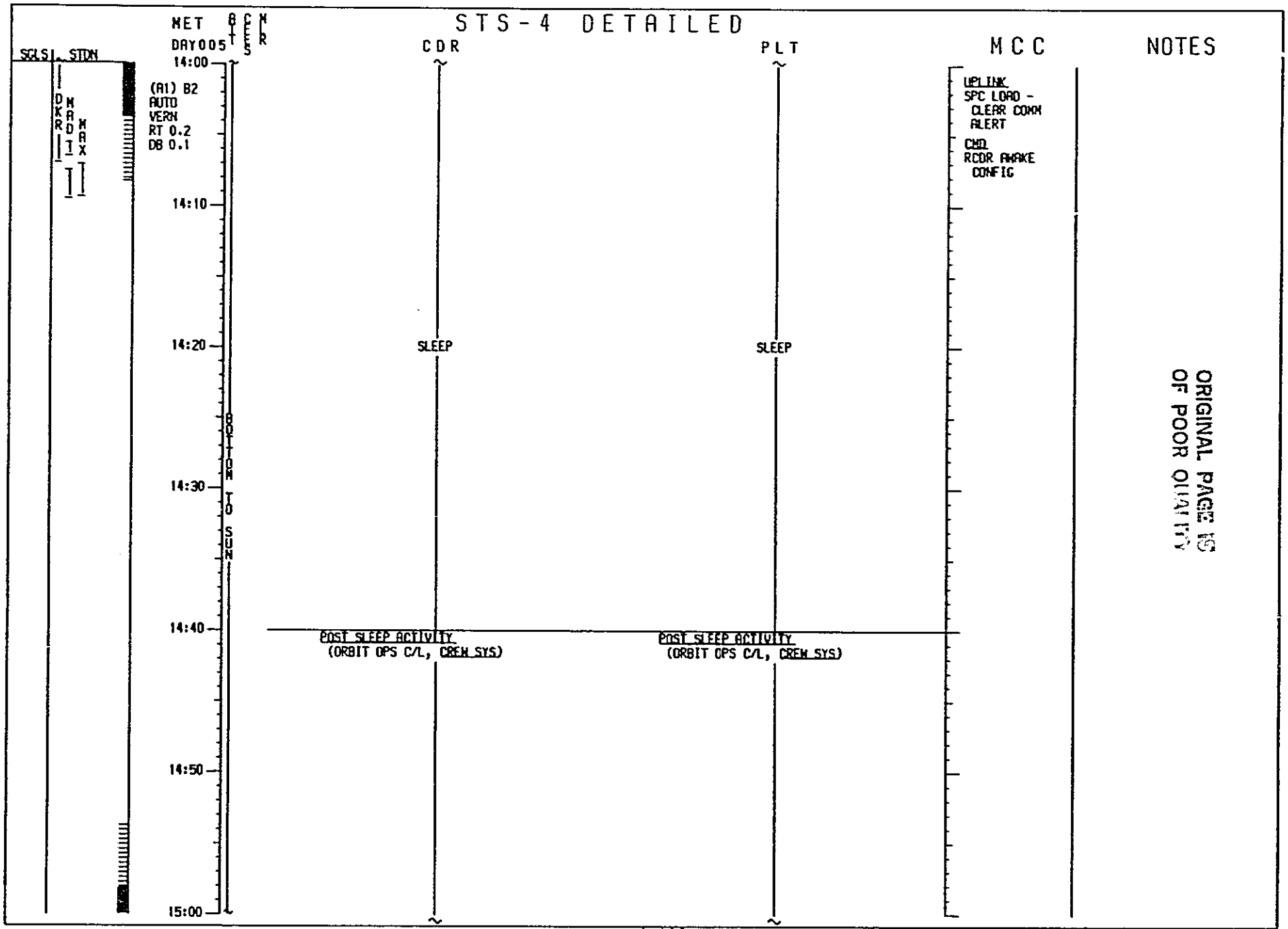
FLT DAY 7

FLT DAY 7



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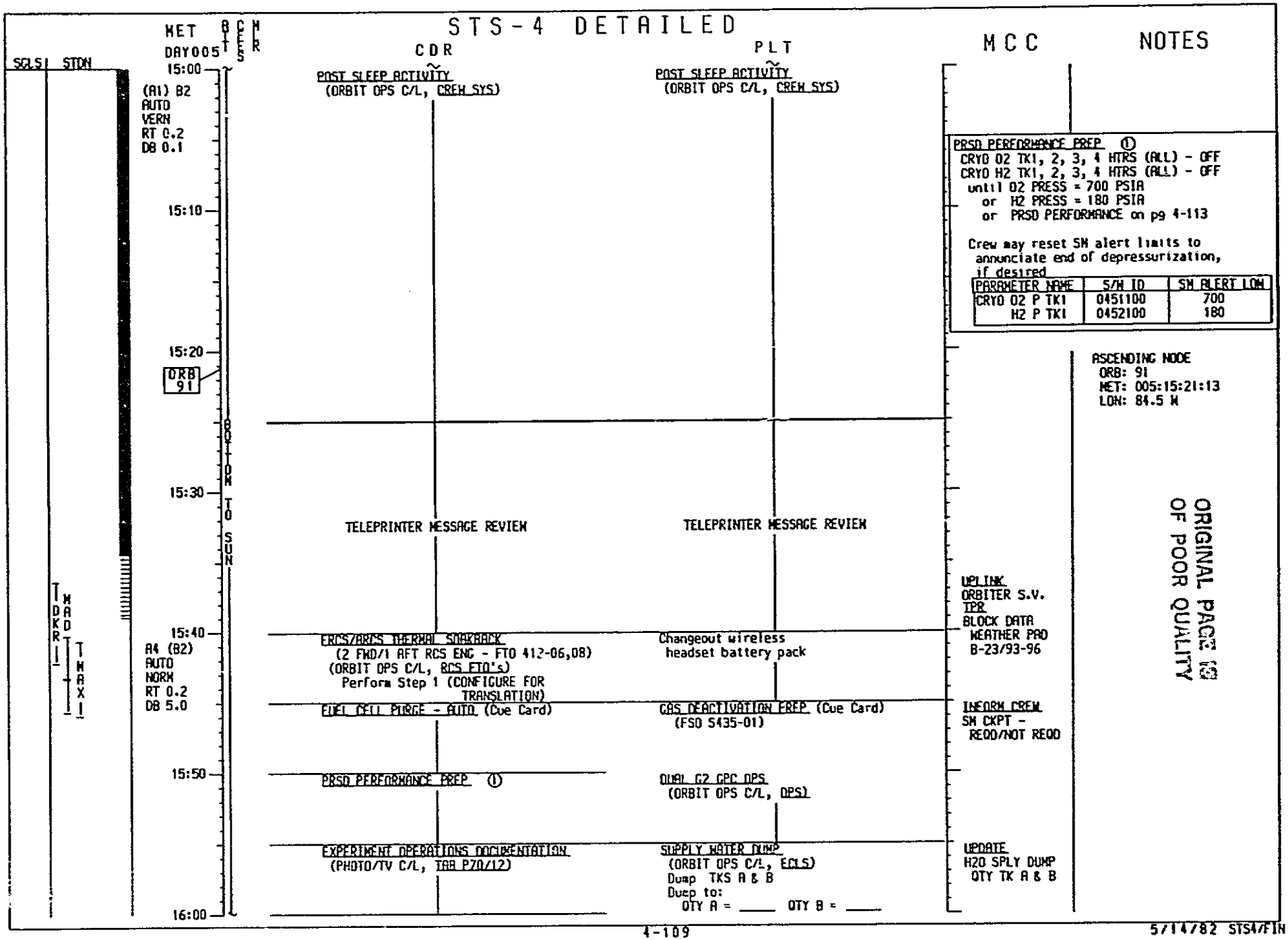
5/14/82 STS4/FTN

STS-4 DETAILED



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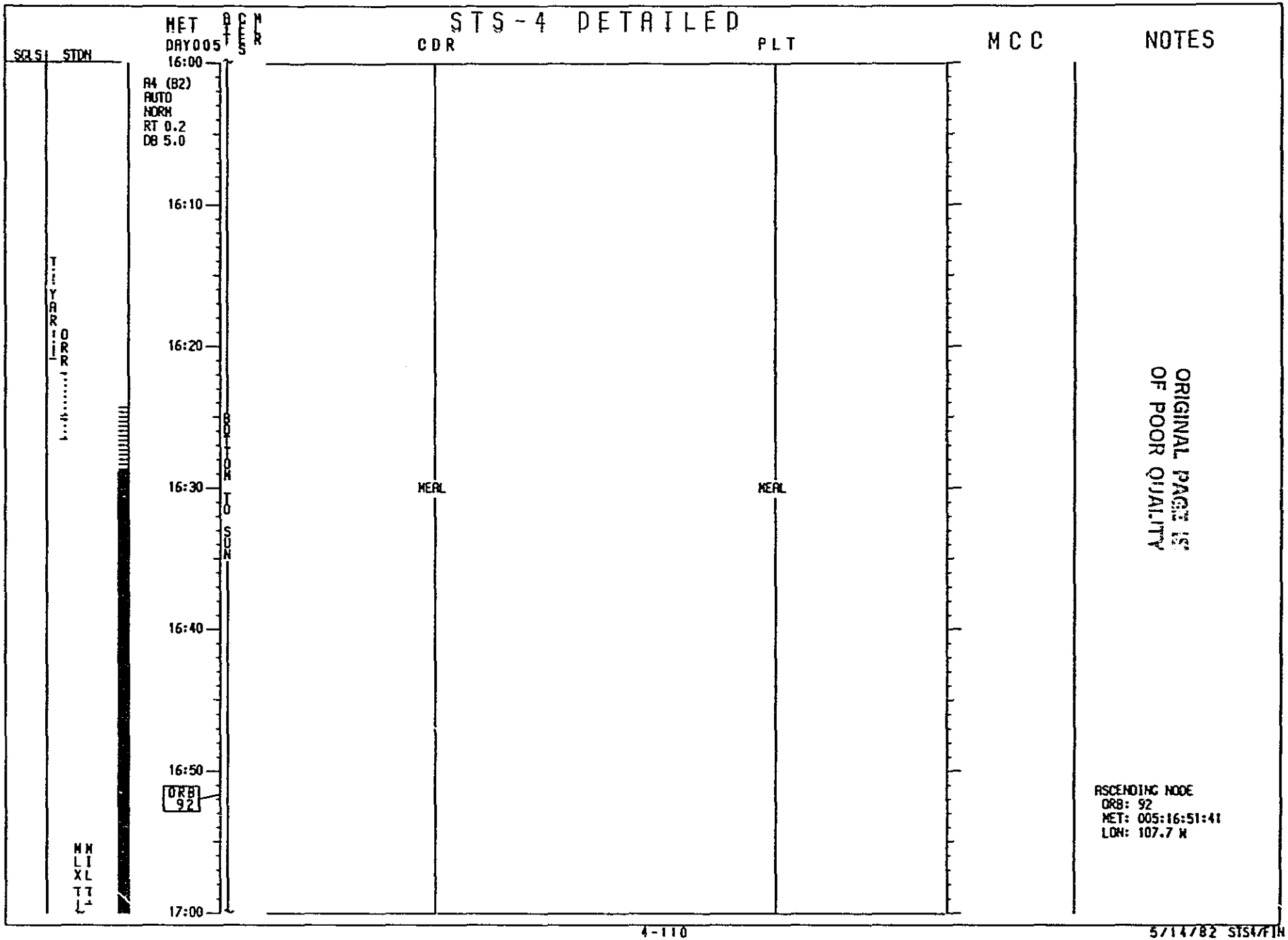
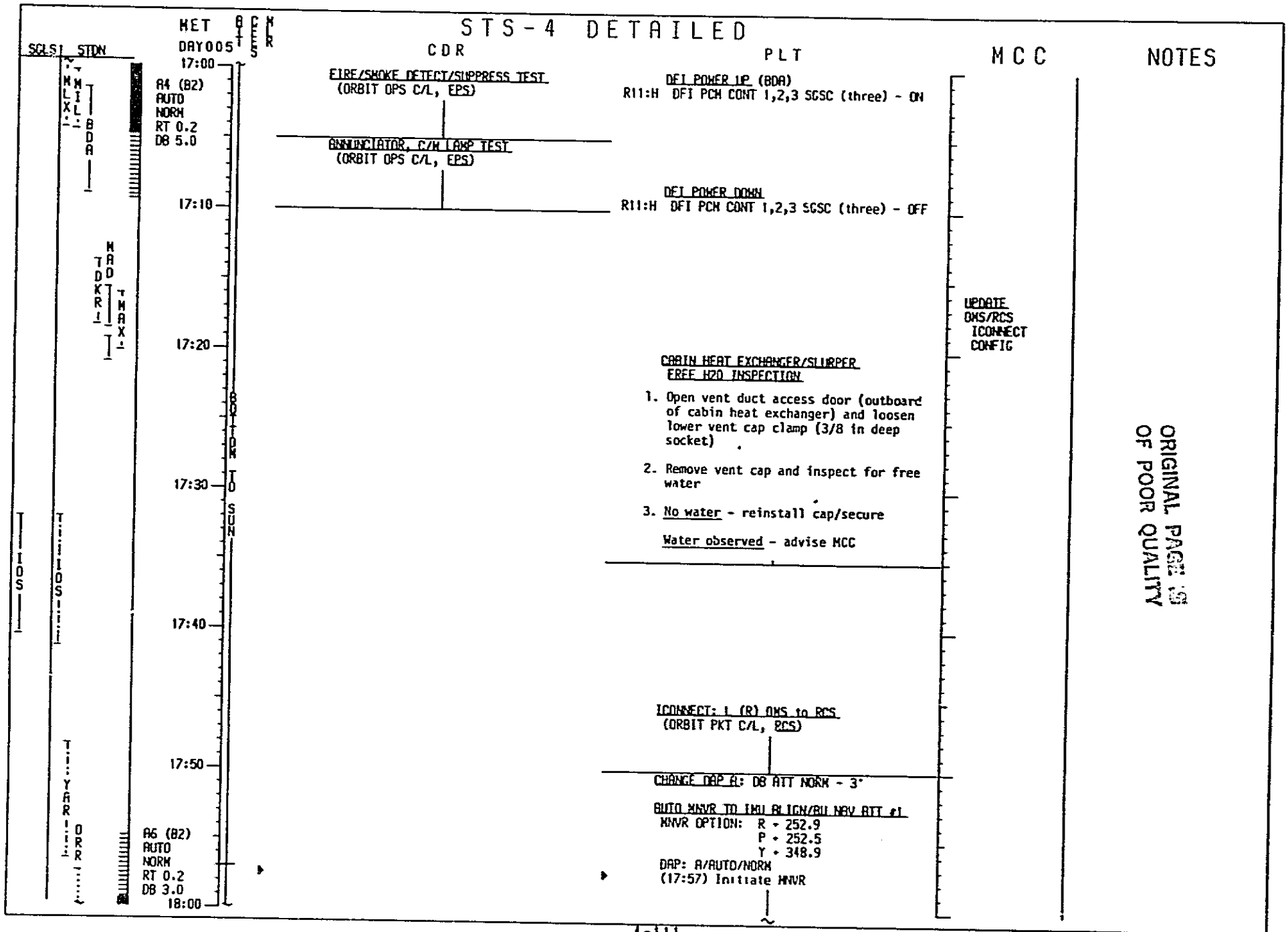


5/14/82 STS4/FIN

STS-4 DETAILED



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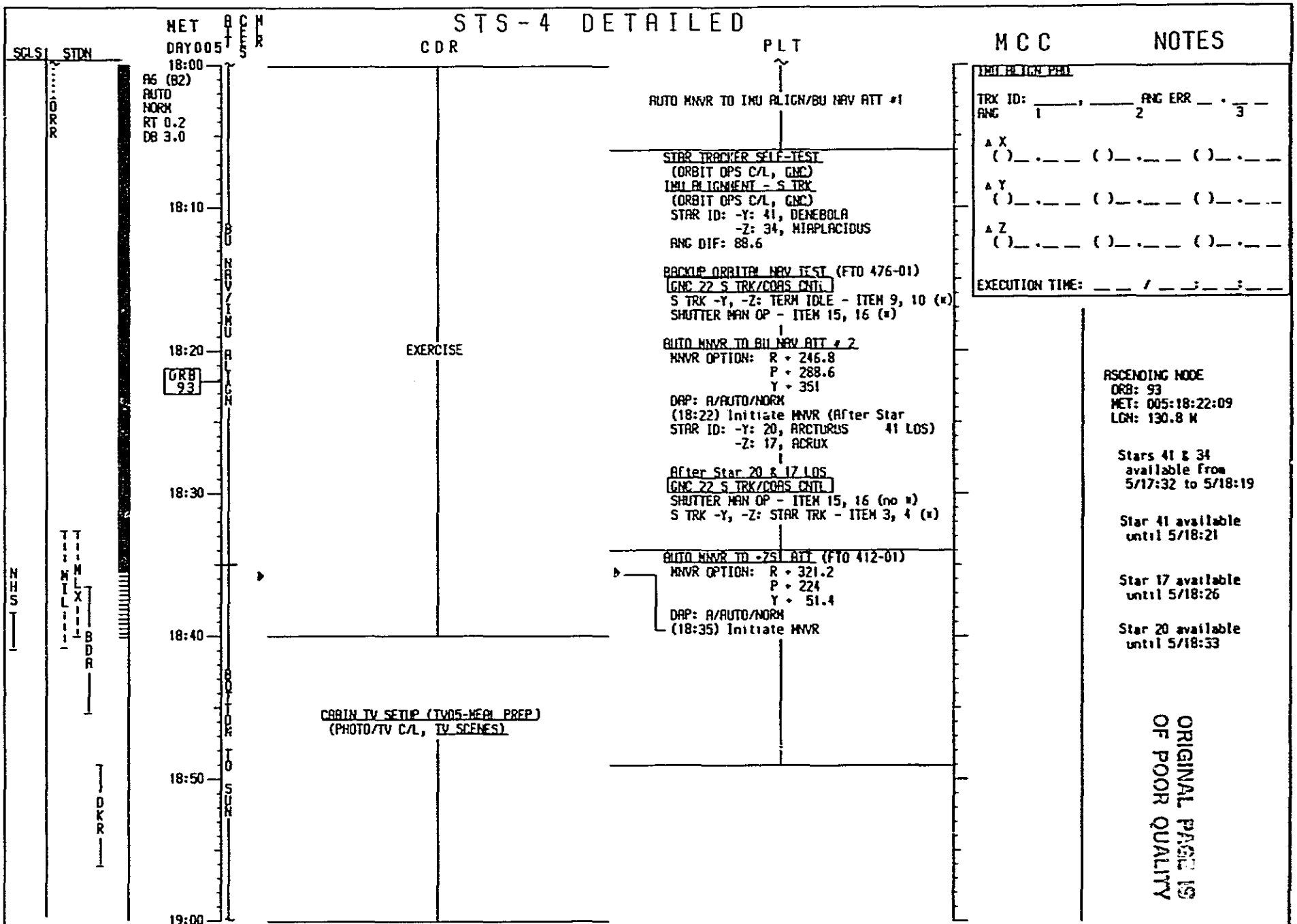

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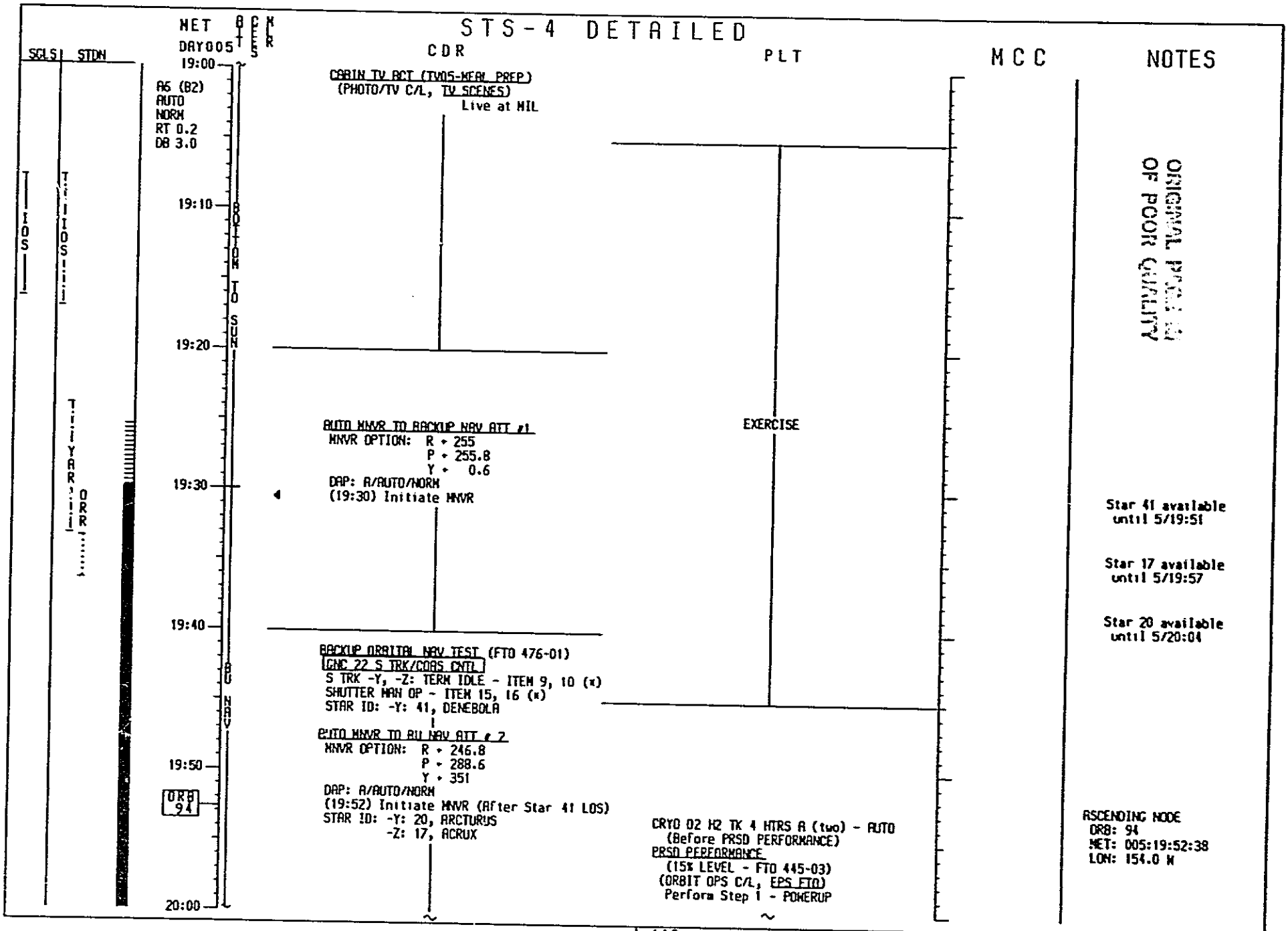
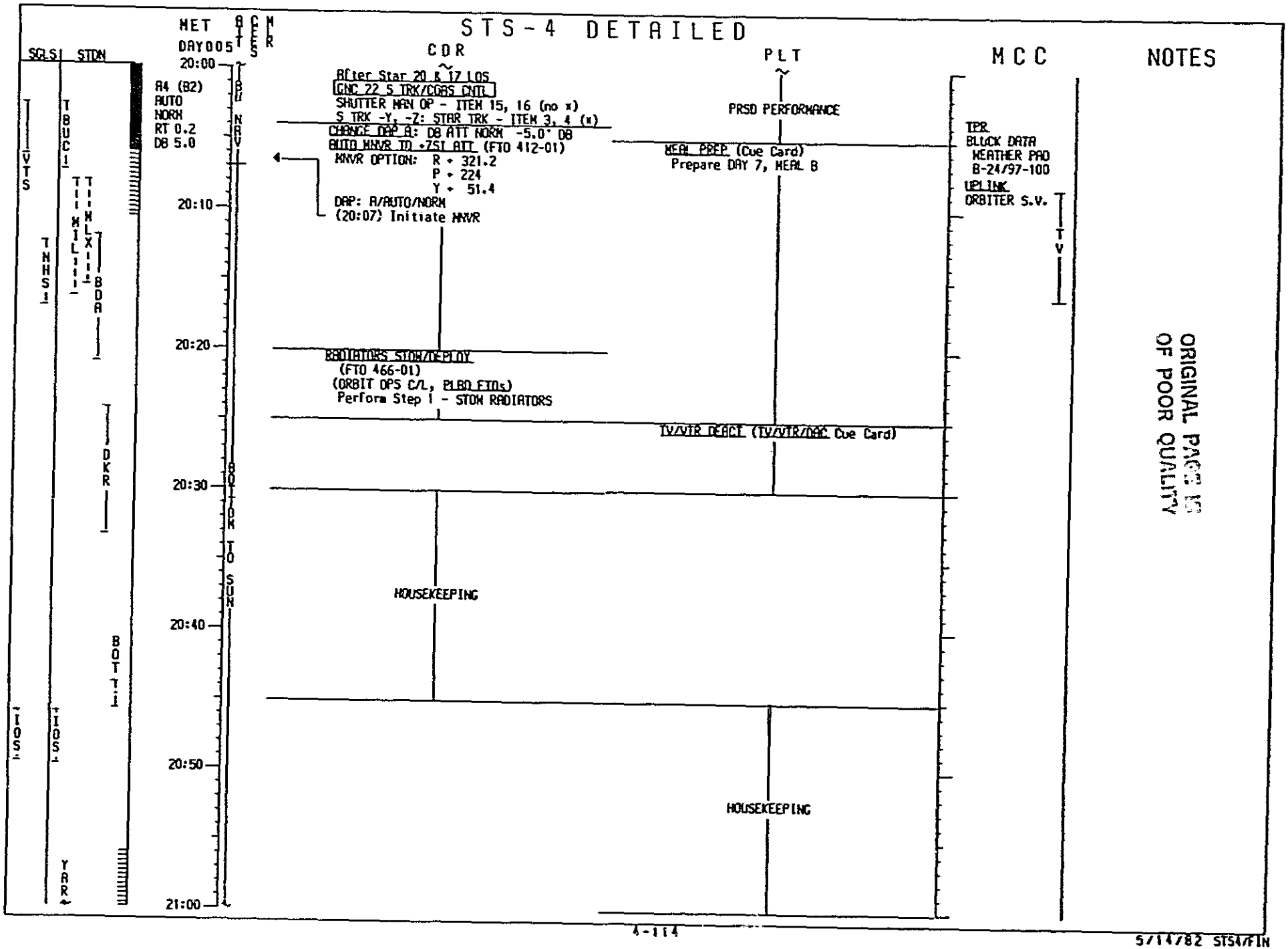

MET
DAY005
SCLS
STDN
19:00
19:10
19:20
19:30
19:40
19:50
20:00
ORB 94
A6 (B2)
AUTO
NORM
RT 0.2
DB 3.0
BOTTOM TO SUN
TOS
TOS
TOS

STS-4 DETAILED



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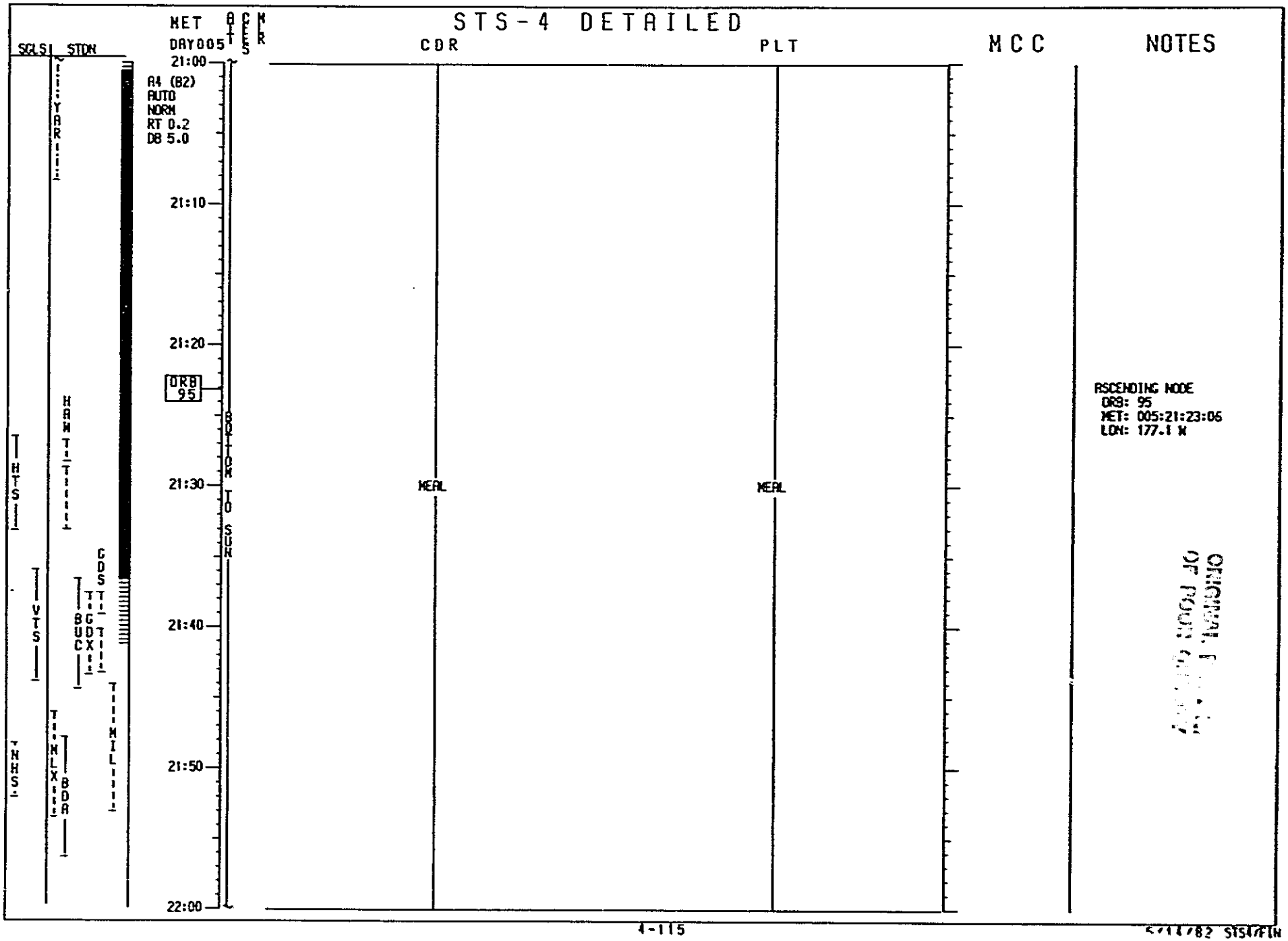
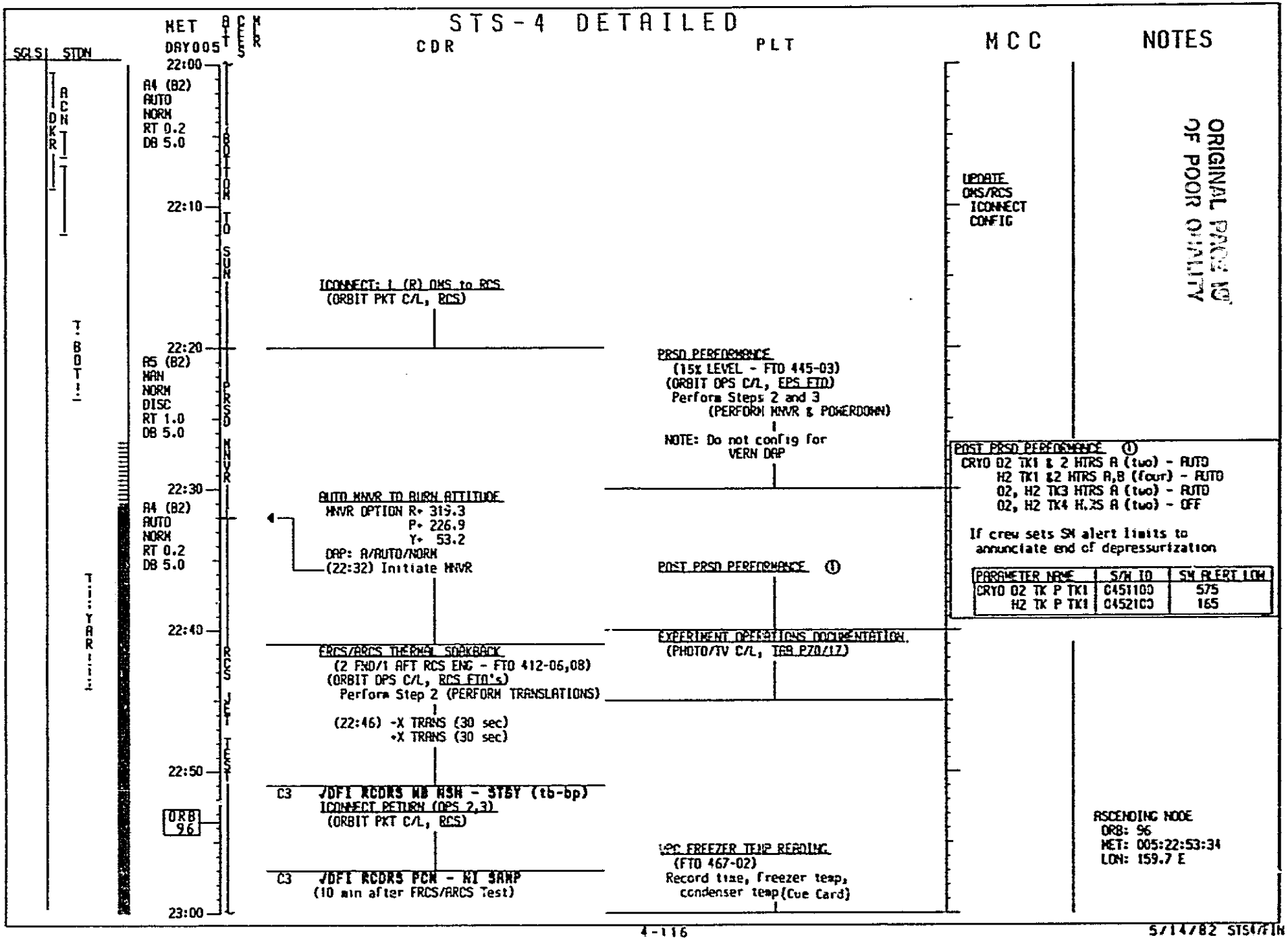
5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY005
SGLS
STDN
21:00
21:10
21:20
21:30
21:40
21:50
22:00
A4 (B2)
AUTO
NORM
RT 0.2
DB 5.0
ORB
95
BOTTOM TO SUN
CDR
PLT
MCC
NOTES
MEAL
MEAL
ASCENDING NODE
ORB: 95
MET: 005:21:23:06
LON: 177.1 W
4-115

STS-4 DETAILED



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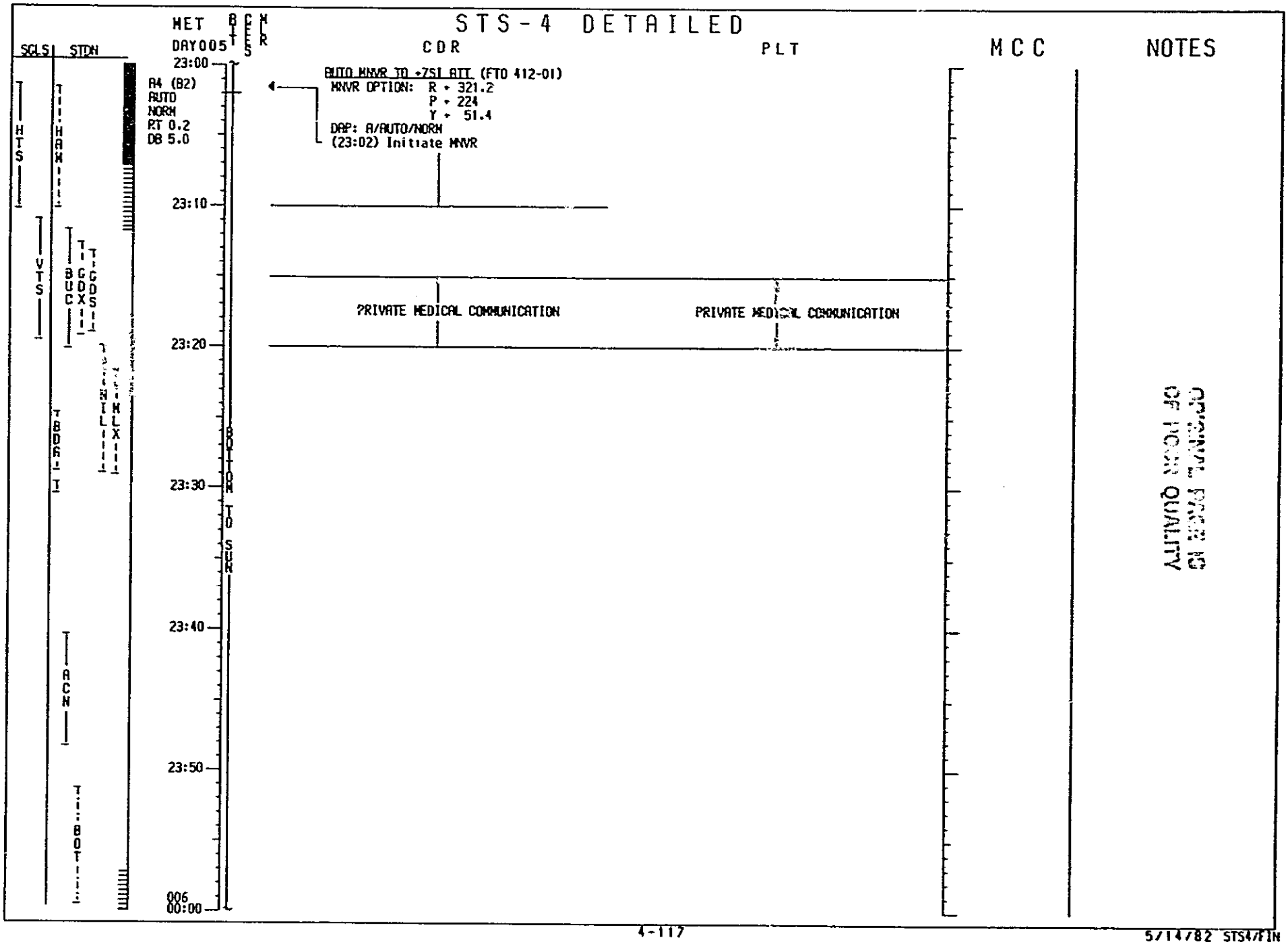
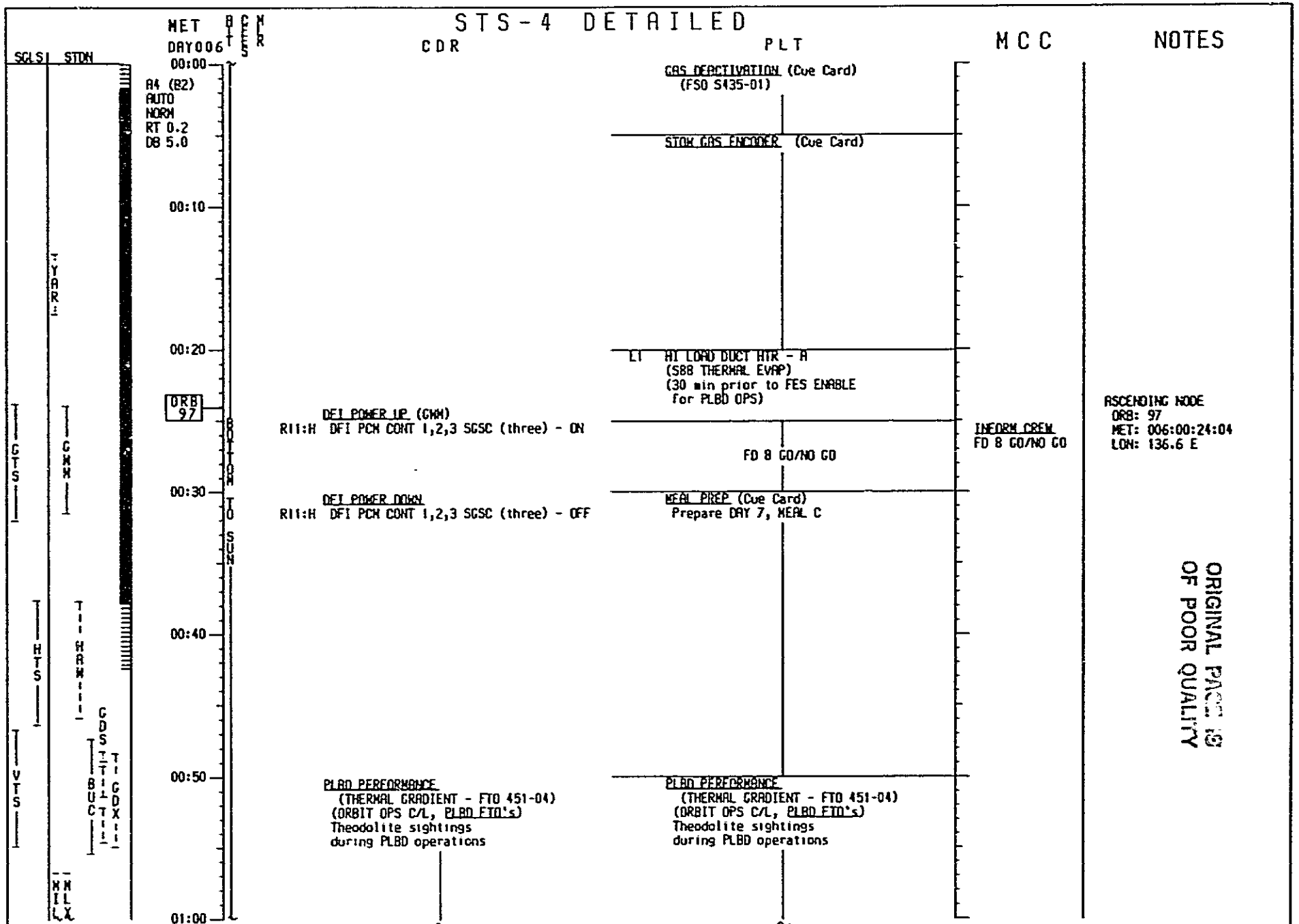

STS-4 DETAILED
MET
DAY005
SGLS
STDN
CDR
PLT
MCC
NOTES
23:00
23:10
23:20
23:30
23:40
23:50
006
00:00
A4 (B2)
AUTO
NORM
RT 0.2
DB 5.0
AUTO MNVR TO +ZSI ATT (FTO 412-01)
MNVR OPTION: R + 321.2
P + 224
Y + 51.4
DAP: A/AUTO/NORM
(23:02) Initiate MNVR
PRIVATE MEDICAL COMMUNICATION
PRIVATE MEDICAL COMMUNICATION
HTS
VTS
ACN
BOTTOM TO SUN

STS-4 DETAILED



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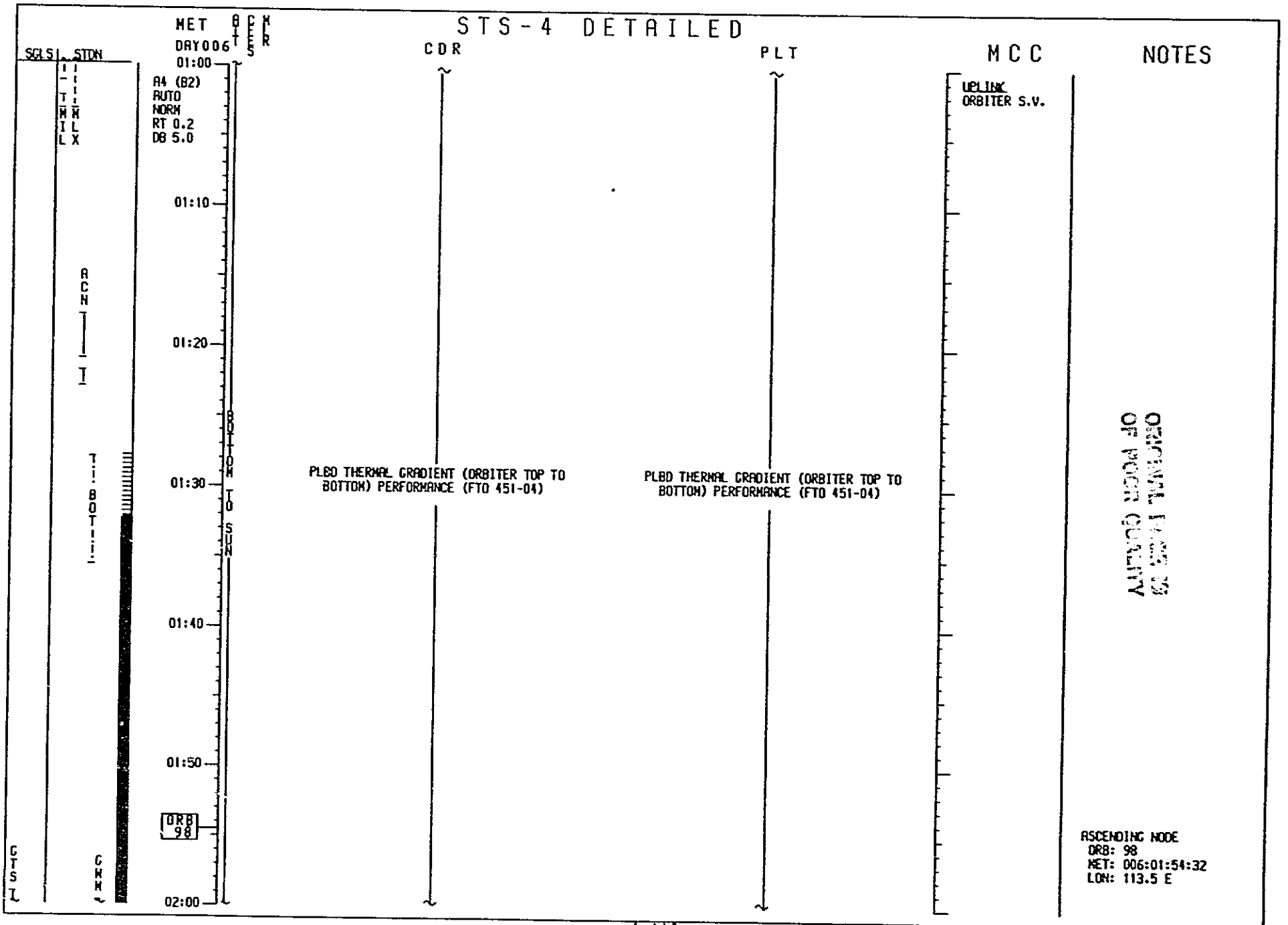
STS-4 DETAILED



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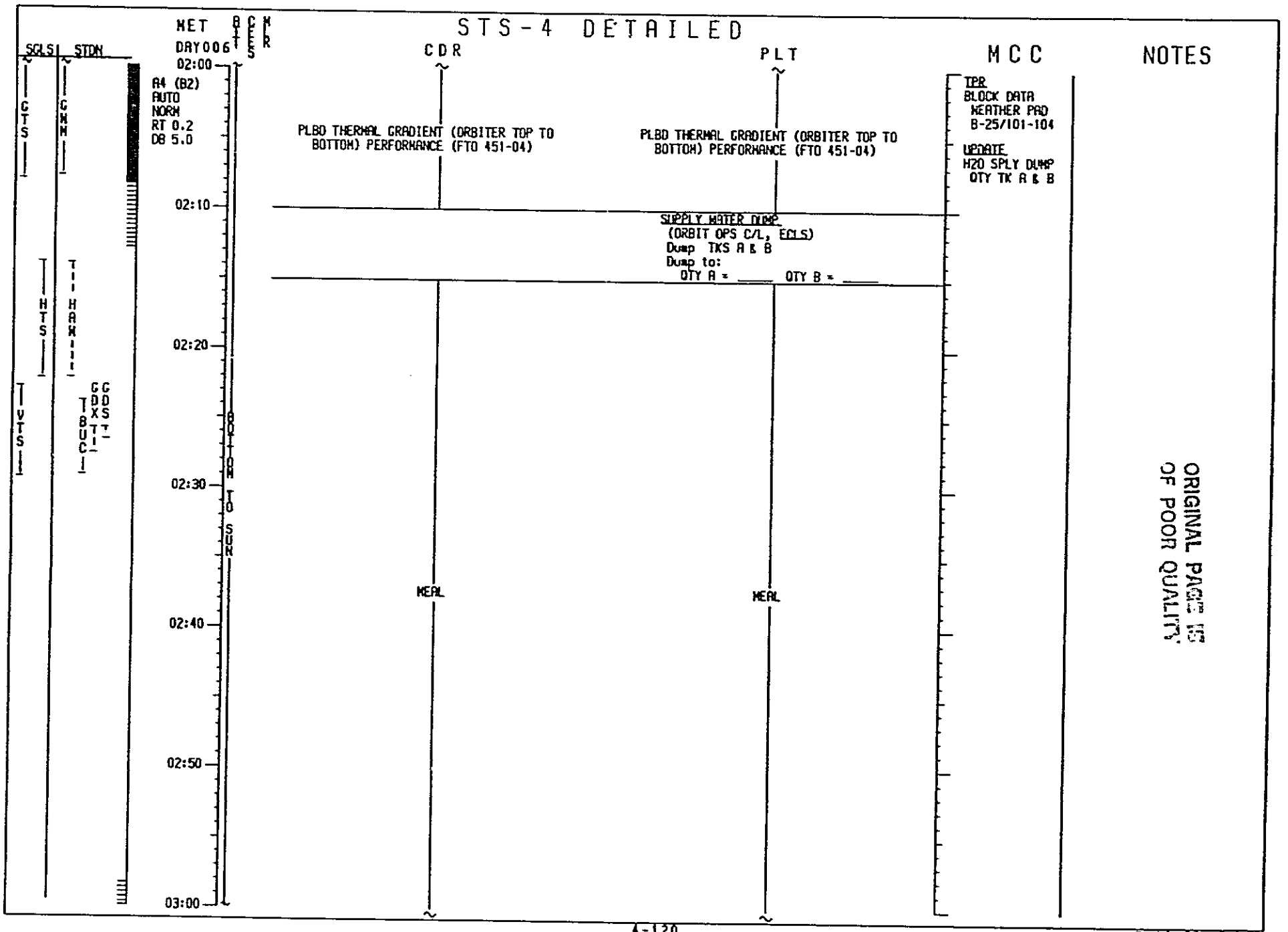

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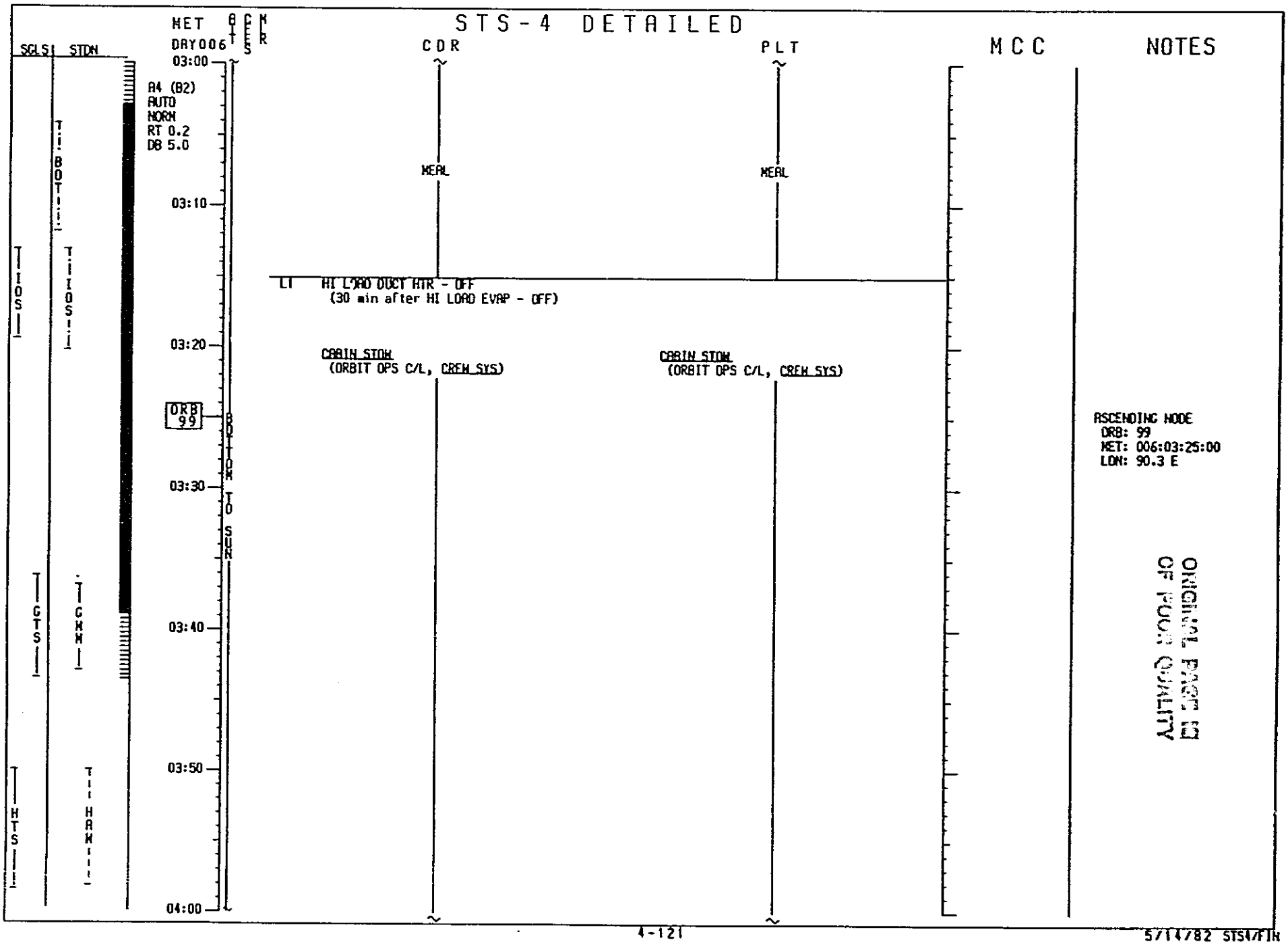
5/14/82 STS4/FIN



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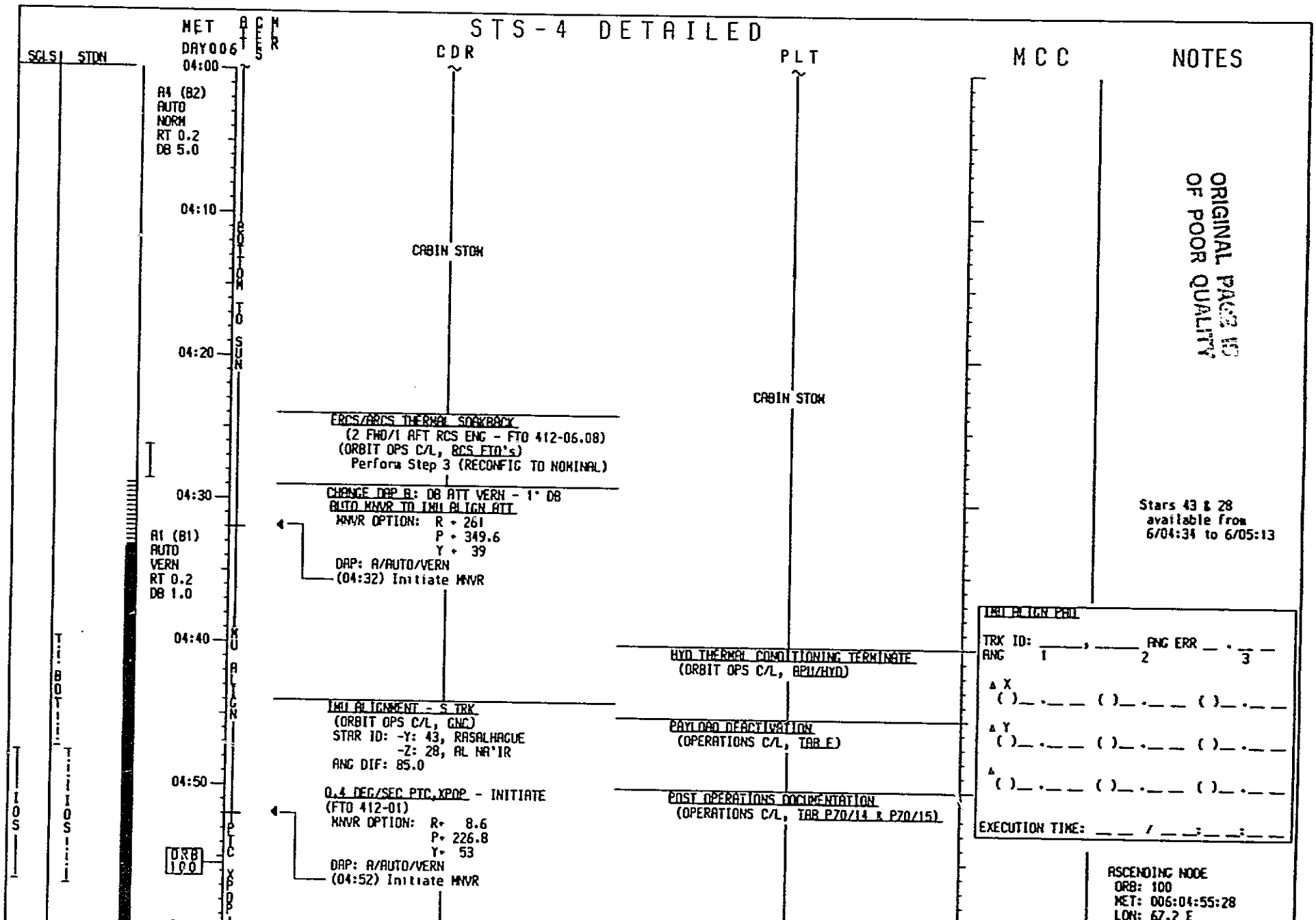

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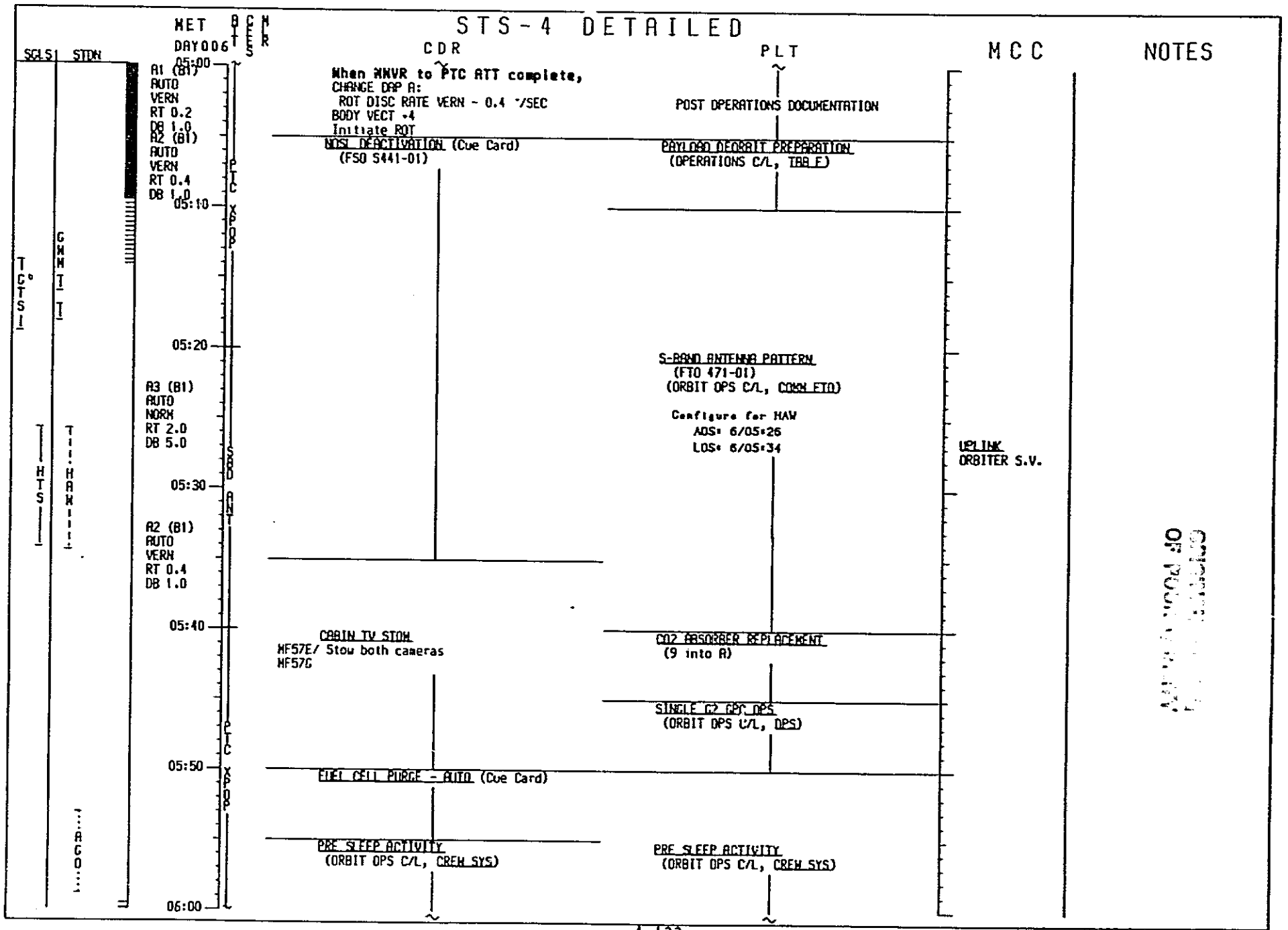
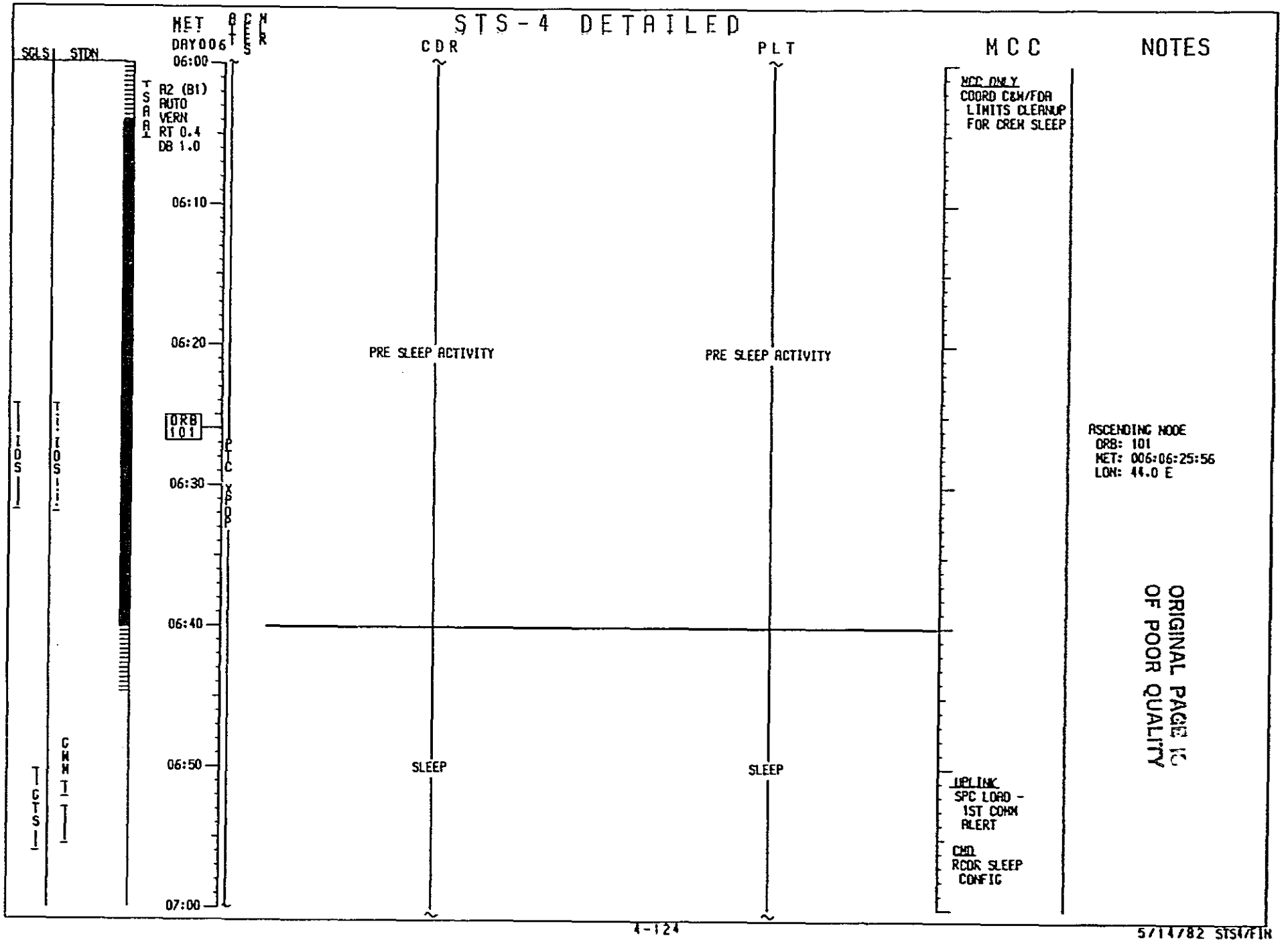
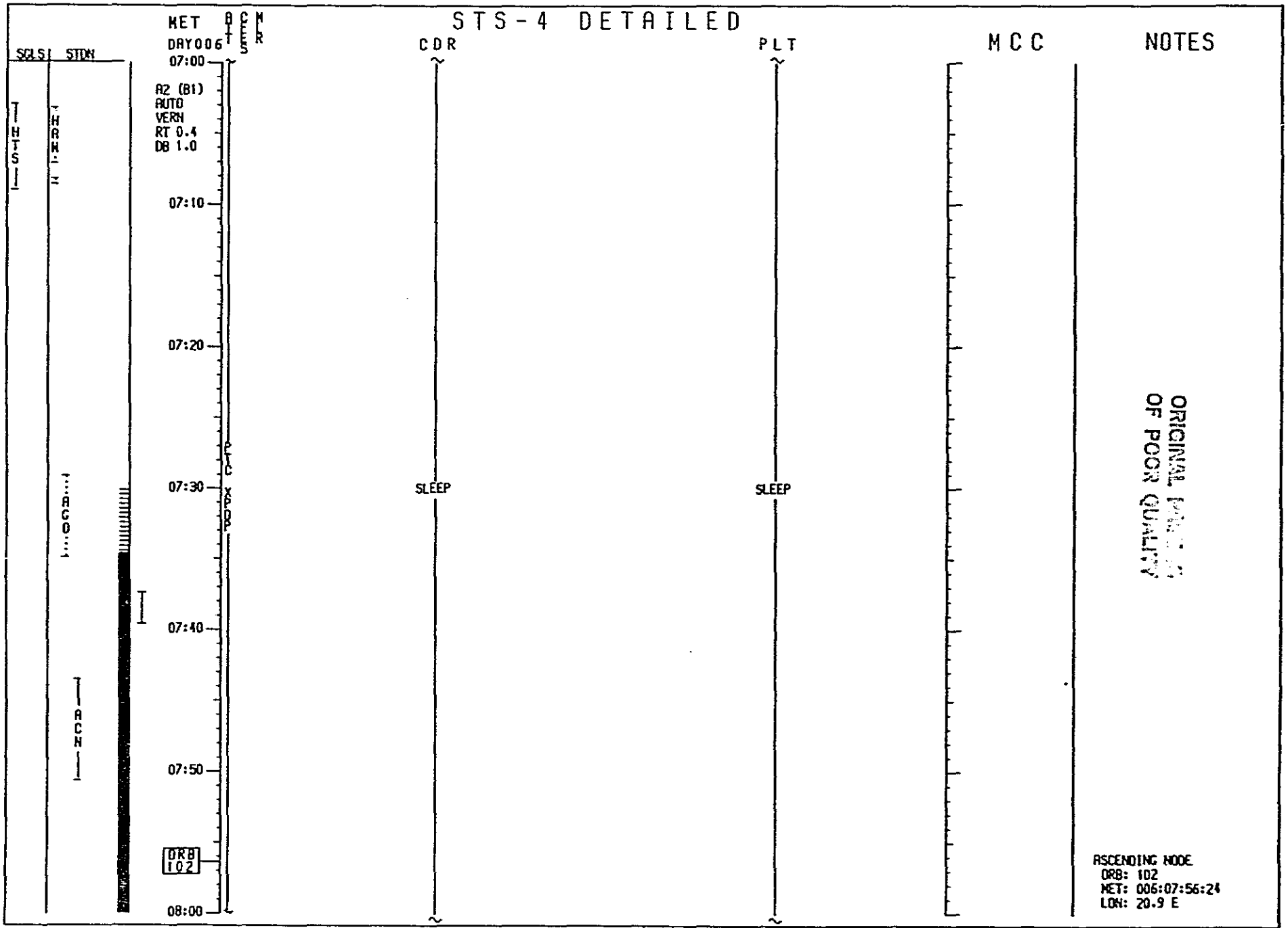
5/14782 STS4/FIN

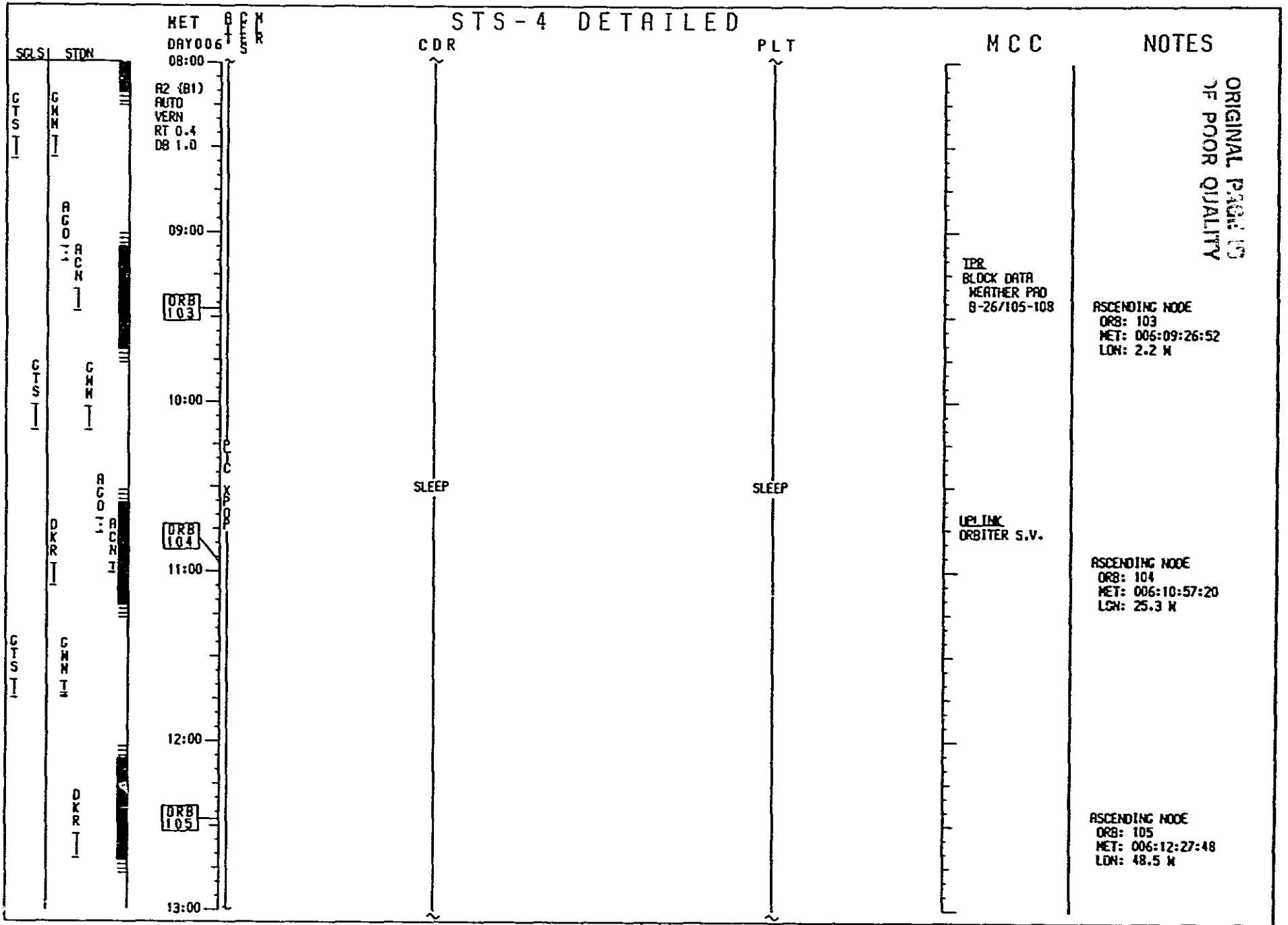

STS-4 DETAILED
MET
DAY 006
SGLS
STDN
BITS
CCMR
CDR
PLT
MCC
NOTES
05:00
05:10
05:20
05:30
05:40
05:50
06:00
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
A3 (B1)
AUTO
NORM
RT 2.0
DB 5.0
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
PTC
XSBD
SSBD ANT
When MNVR to PTC ATT complete,
CHANGE DAP A:
ROT DISC RATE VERN - 0.4 °/SEC
BODY VECT +4
Initiate ROT
NOSE DEACTIVATION (Cue Card)
(FSO S441-01)
POST OPERATIONS DOCUMENTATION
PAYLOAD DEORBIT PREPARATION
(OPERATIONS C/L, TAB F)
S-BAND ANTENNA PATTERN
(FTO 471-01)
(ORBIT OPS C/L, COMM FTO)
Configure for MAN
AOS: 6/05:26
LOS: 6/05:34
UPLINK
ORBITER S.V.
CABIN TV STOW
HF57E/ Stow both cameras
HF57G
CO2 ABSORBER REPLACEMENT
(9 into A)
SINGLE G2 GPC OPS
(ORBIT OPS C/L, OPS)
FUEL CELL PURGE - AUTO (Cue Card)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)



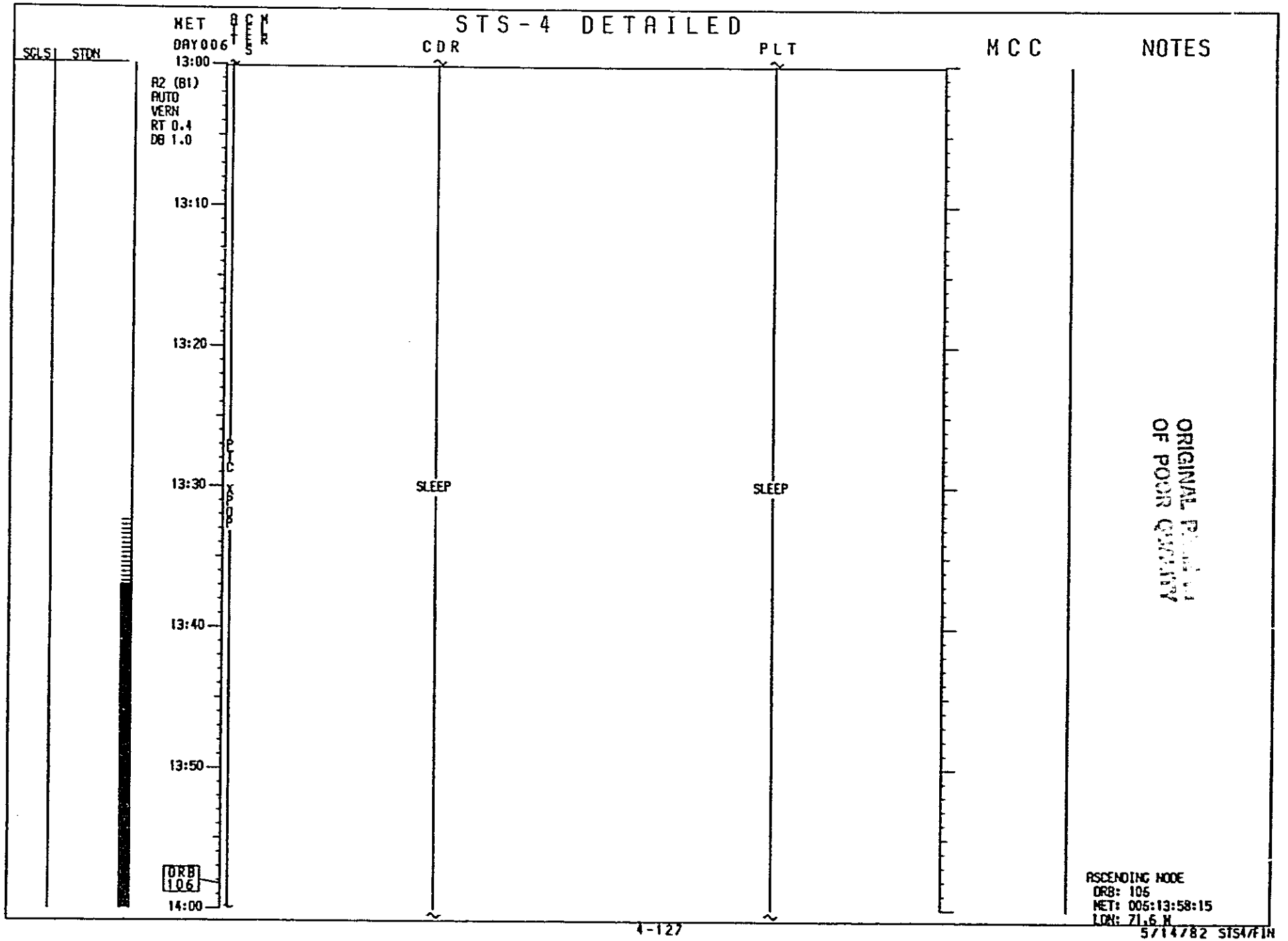
5/14/82 STS4/FIN



5/14/82 STS4/FIN

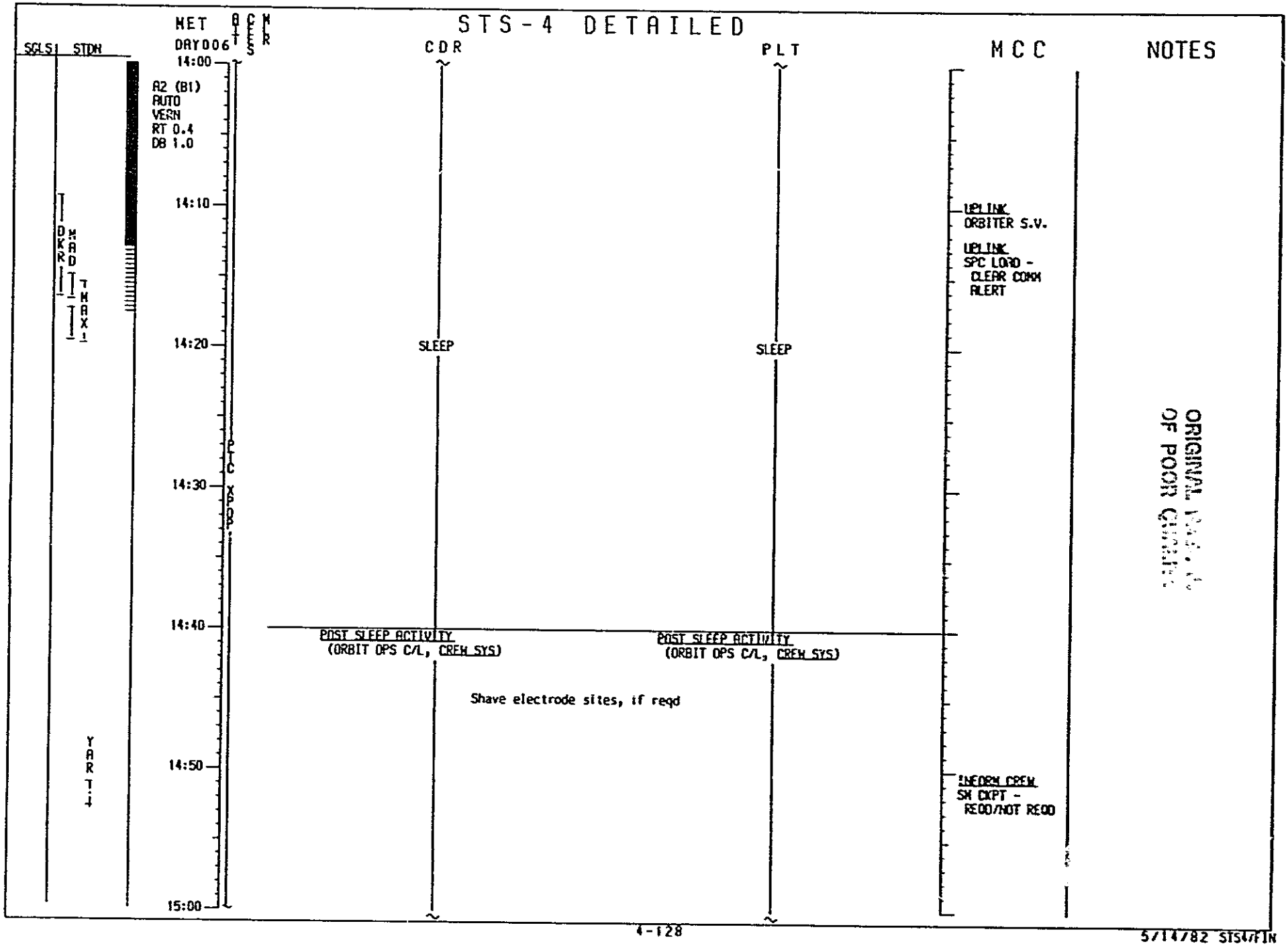


5714/82 STS4/FIN


STS-4 DETAILED
MET
DAY 006
SGLS
STDN
ATT
CMD
MNVR
CDR
PLT
MCC
NOTES
13:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
13:10
13:20
PTC
XSPR
13:30
SLEEP
SLEEP
13:40
13:50
ORB
106
14:00
ORIGINAL PAGE IS
OF POOR QUALITY
ASCENDING NODE
ORB: 106
MET: 005:13:58:15
LON: 71.6 W
5/14/82 STS4/FIN

FLT DAY 8

STS-4 DETAILED



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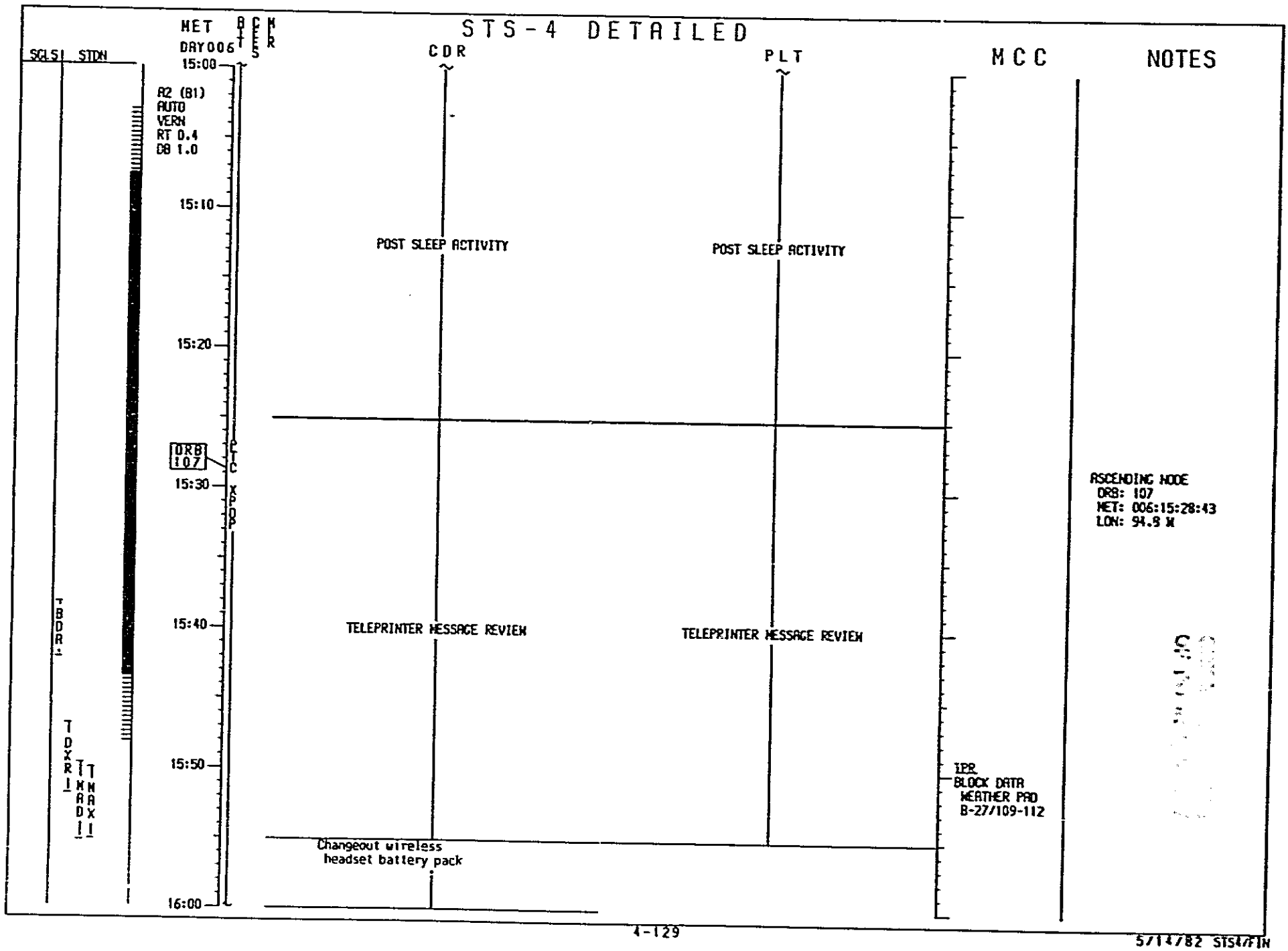
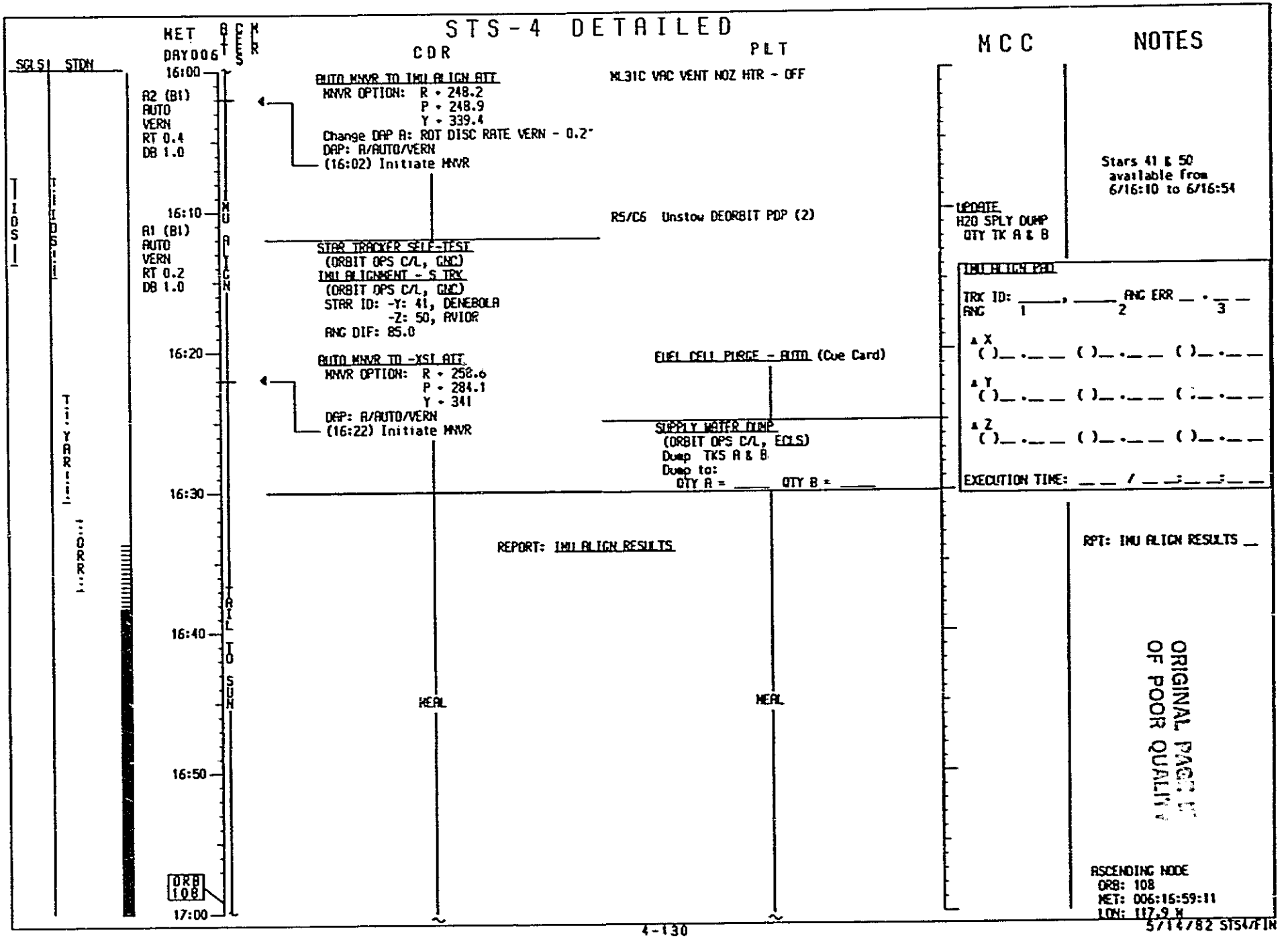

STS-4 DETAILED
MET
DAY 006
SGLS
STDN
BFS
MCR
15:00
15:10
15:20
15:30
15:40
15:50
16:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
ORB
107
PTC
XPDR
TDRS-I
TDRS-II
TDRS-II
CDR
PLT
MCC
NOTES
POST SLEEP ACTIVITY
POST SLEEP ACTIVITY
TELEPRINTER MESSAGE REVIEW
TELEPRINTER MESSAGE REVIEW
Changeout wireless
headset battery pack
IPR
BLOCK DATA
WEATHER PAD
B-27/109-112
ASCENDING NODE
ORB: 107
MET: 006:15:28:43
LON: 94.8 W
5/14/82 STS4/FIN

STS-4 DETAILED



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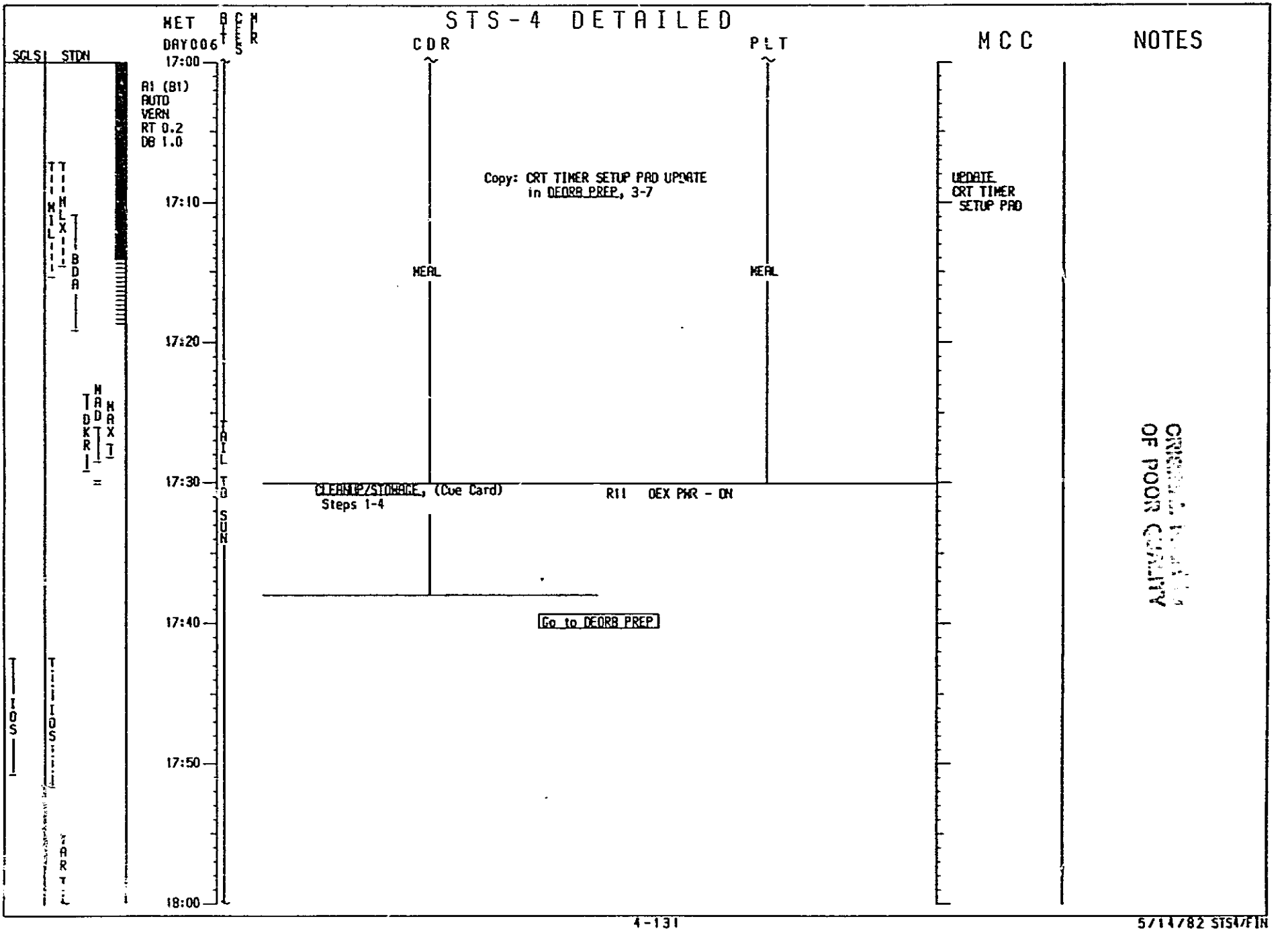
5/14/82 STS4/FIN

STS-4 DETAILED



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CONTINGENCY TIMELINES

HIGH PRIORITY MISSION

The High Priority Mission (HPM) is designed as a 74.3 hour flight lasting 3.5 flight days (FD). To enter HPM, complete the nominal FD 1 through 0/17:30. Begin HPM at 0/17:30.

HPM ACTIVITIES

FLIGHT DAY 1 - NOMINAL CAP FD 1 THROUGH SLEEP TO 0/17:30.

FLIGHT DAY 2 - BEGIN HPM SECTION AT 0/17:30. ACTIVITIES ARE SIMILAR TO NOMINAL CAP UNTIL 1/00:15 WHEN CFES SAMPLE 6 IS RUN.

- o ATTITUDES
  - o GRAVITY GRADIENT (8 HRS vs 12 HRS)
  - o BOTTOM SUN (26 HRS vs 33 HRS)
- o IECM CONTAMINATION SURVEY (1 HR) SCHEDULED WITH TOP SUN FOR WARM THERMAL ENVIRONMENT
- o IECM PLUME SURVEY (1 HR) IN BOTTOM SUN
- o HOT FIRE TEST
- o MLR DEACTIVATION (19.5 HRS)

FLIGHT DAY 3 -

- o FRCS THERMAL SOAKBACK, PULSE MODE - F3F
- o IECM GAS RELEASE
- o FRCS THERMAL SOAKBACK, TWO FORWARD ENGINES - F2F, F3F
- o FCS CHECKOUT, PART 1 AND 2. STAY ON TAIL ONLY JETS SO NO PRCS FIRINGS IN FORWARD POD. (REQUIREMENT OF FRCS THERMAL SOAKBACK TESTS)
- o RADIATOR PERFORMANCE TEST. STOW RADIATORS 3 HRS PRIOR TO PLBD CYCLE TEST, THEN DEPLOY AFTER PLBDs OPENED
- o PLBD CYCLE TEST AT THE END OF BOTTOM SUN THERMAL TEST
- o PTC FOR SLEEP

FLIGHT DAY 4 -

- o TAIL SUN AFTER MORNING IMU ALIGN
- o NOMINAL DEORBIT PREP (5 HRS)

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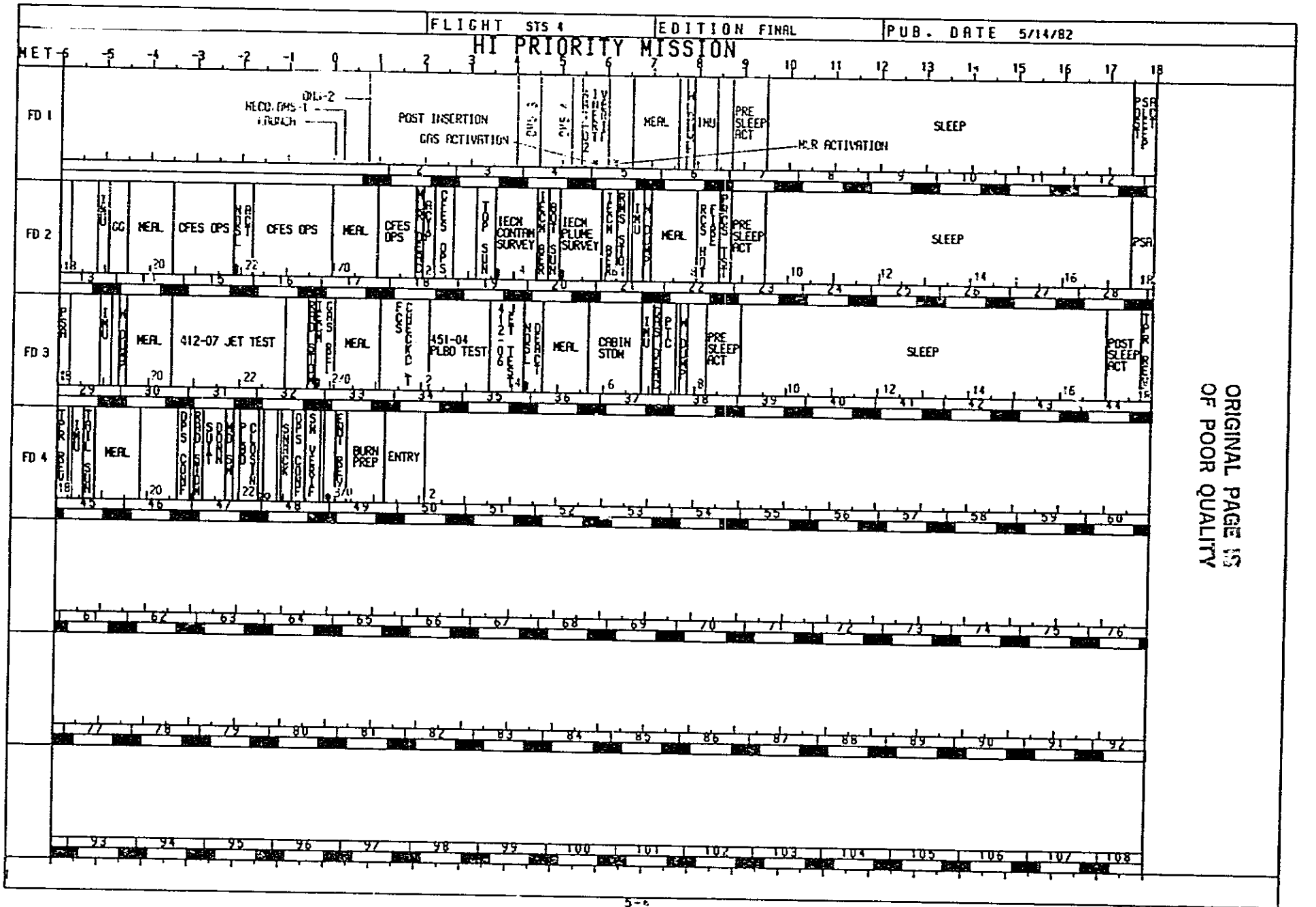

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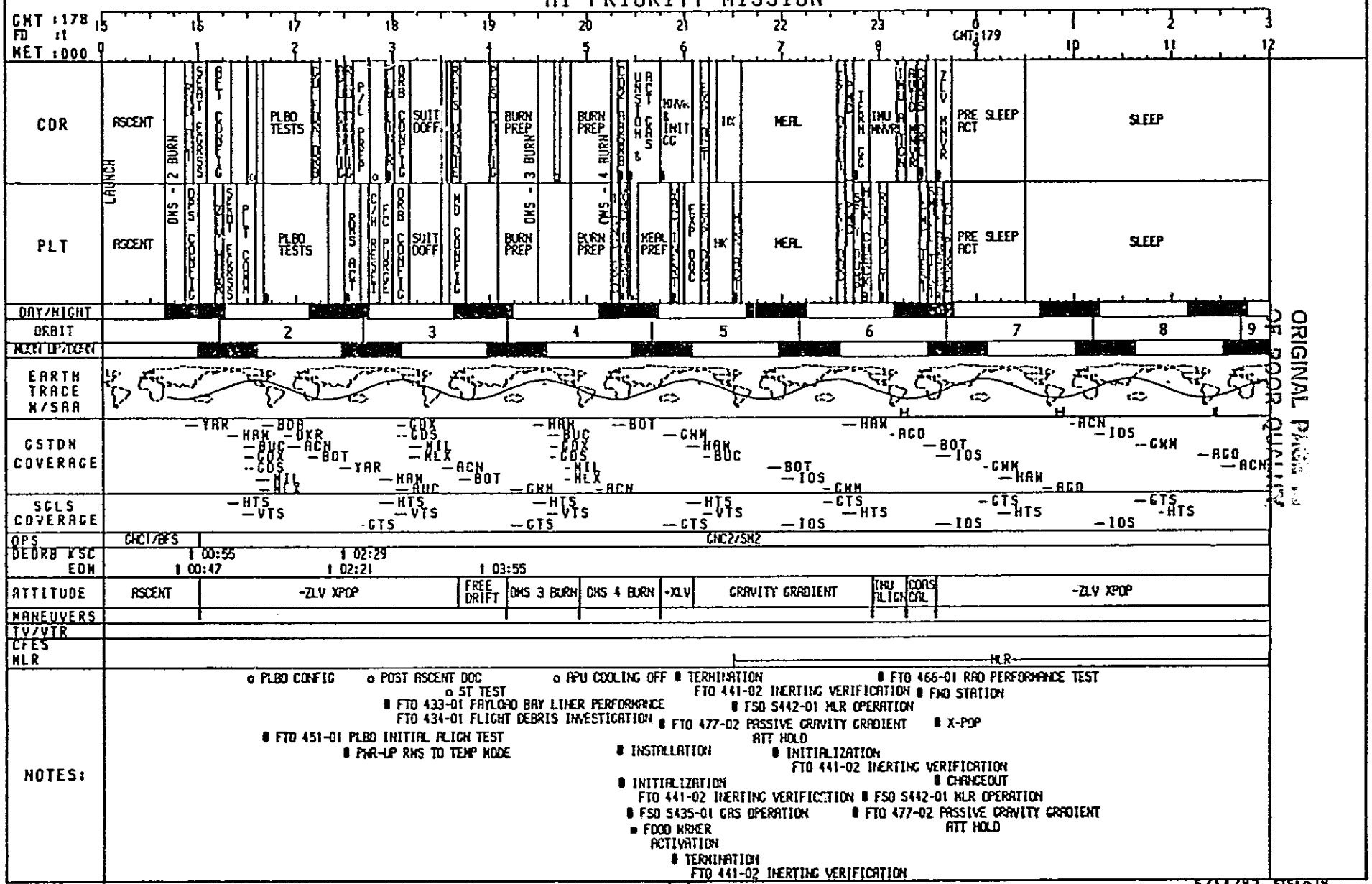
178:15:00/ 179:03:00	000:00:00/ 000:12:00	178:10:00/ 178:22:00	1/ 178 CDT	-1.2		JUNE 27, 1982	STS-4	FINAL	5/14/82

HI PRIORITY MISSION



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5/14/82 STS4/IN

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
179:03:00/ 179:15:00	000:12:00/ 001:00:00	178:22:00/ 179:10:00	2/ 178 CDT	0.2		JUNE 28, 1982	STS 4	FINAL	5/14/82

HI PRIORITY MISSION

GMT :179 FD 1
MET :000

FD 2

CDR: SLEEP | POST SLEEP ACT | TAPE MSC | REV MSC | IMU ALIGN | HAVR & INIT CG | MEAL | TV SETUP | NOSL ACT | HK | MEAL PREP

PLT: SLEEP | POST SLEEP ACT | POST SLEEP EXER | TAPE MSC | REV MSC | IMU ALIGN | EEP DOC | MEAL | ACT/ PHOTO PREP | FLUX SAMPLE CONT | S BAND DOC | HK | TRAY OPS COLLECTION

DAY/NIGHT

ORBIT: 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16

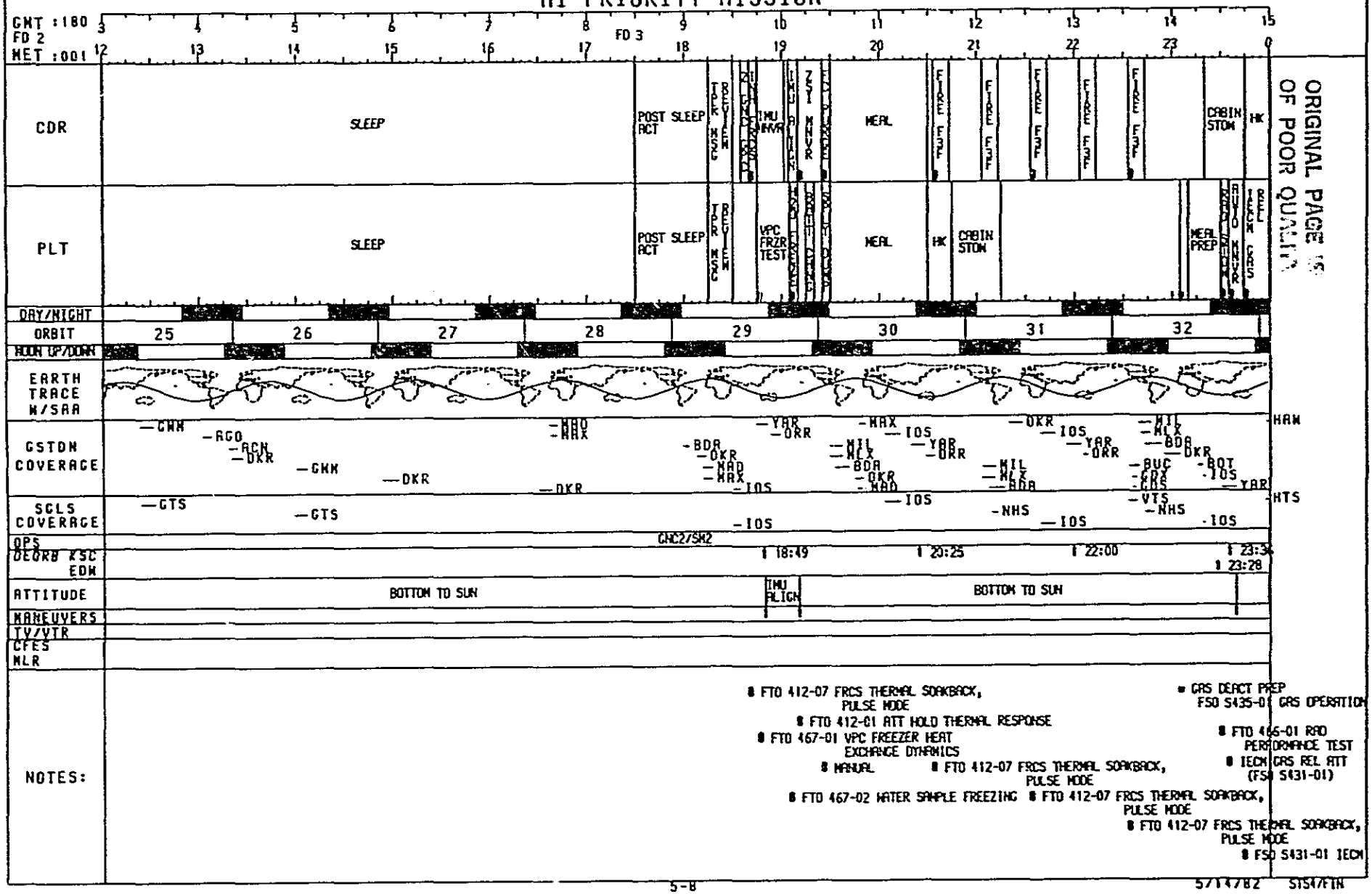
MOON UP/DOWN

EARTH TRACE M/SAA

GSTDN COVERAGE: GWM, AGO, ACN, DKR, GWM, ACN, GWM, DKR, MAD, YAR, ORR, MAD, MAD, MAD, DKR, MAD, MAD, MAD

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
180:03:00/ 180:15:00	001:12:00/ 002:00:00	179:22:00/ 180:10:00	/ 179 CDT	2.1		JUNE 29, 1982	STS 4	FINAL	5/14/82

HI PRIORITY MISSION



NOTES:

- FTO 412-07 FRCS THERMAL SOAKBACK, PULSE MODE
- FTO 412-01 ATT HOLD THERMAL RESPONSE
- FTO 467-01 VPC FREEZER HEAT EXCHANGE DYNAMICS
- MANUAL
- FTO 412-07 FRCS THERMAL SOAKBACK, PULSE MODE
- FTO 467-02 WATER SAMPLE FREEZING
- FTO 412-07 FRCS THERMAL SOAKBACK, PULSE MODE
- FTO 412-07 FRCS THERMAL SOAKBACK, PULSE MODE
- FTO 412-07 FRCS THERMAL SOAKBACK, PULSE MODE
- GAS DEACT PREP FSO S435-01 GAS OPERATION
- FTO 466-01 RAD PERFORMANCE TEST
- IECM GAS REL ATT (FSO S431-01)
- FSO S431-01 IECM

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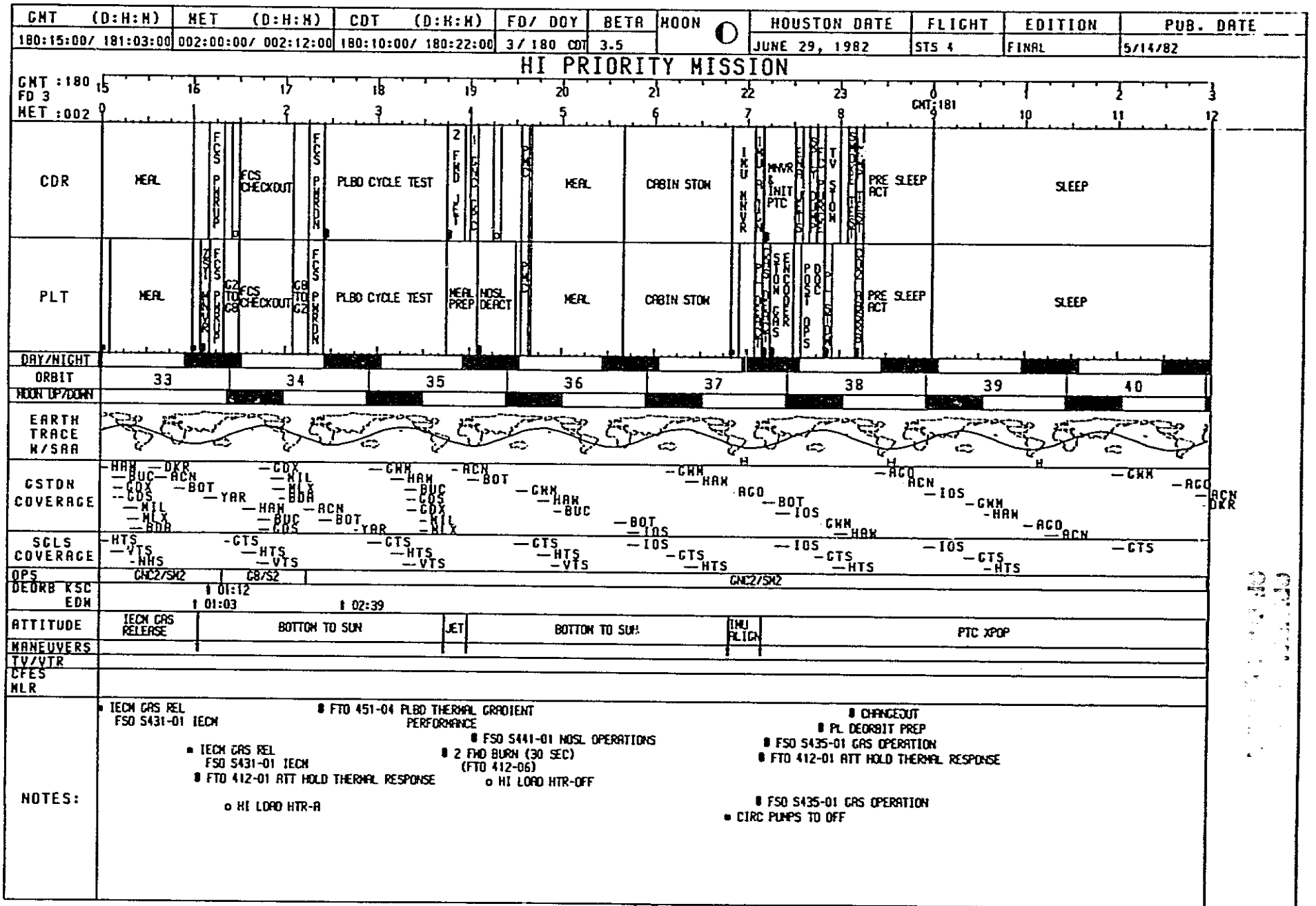
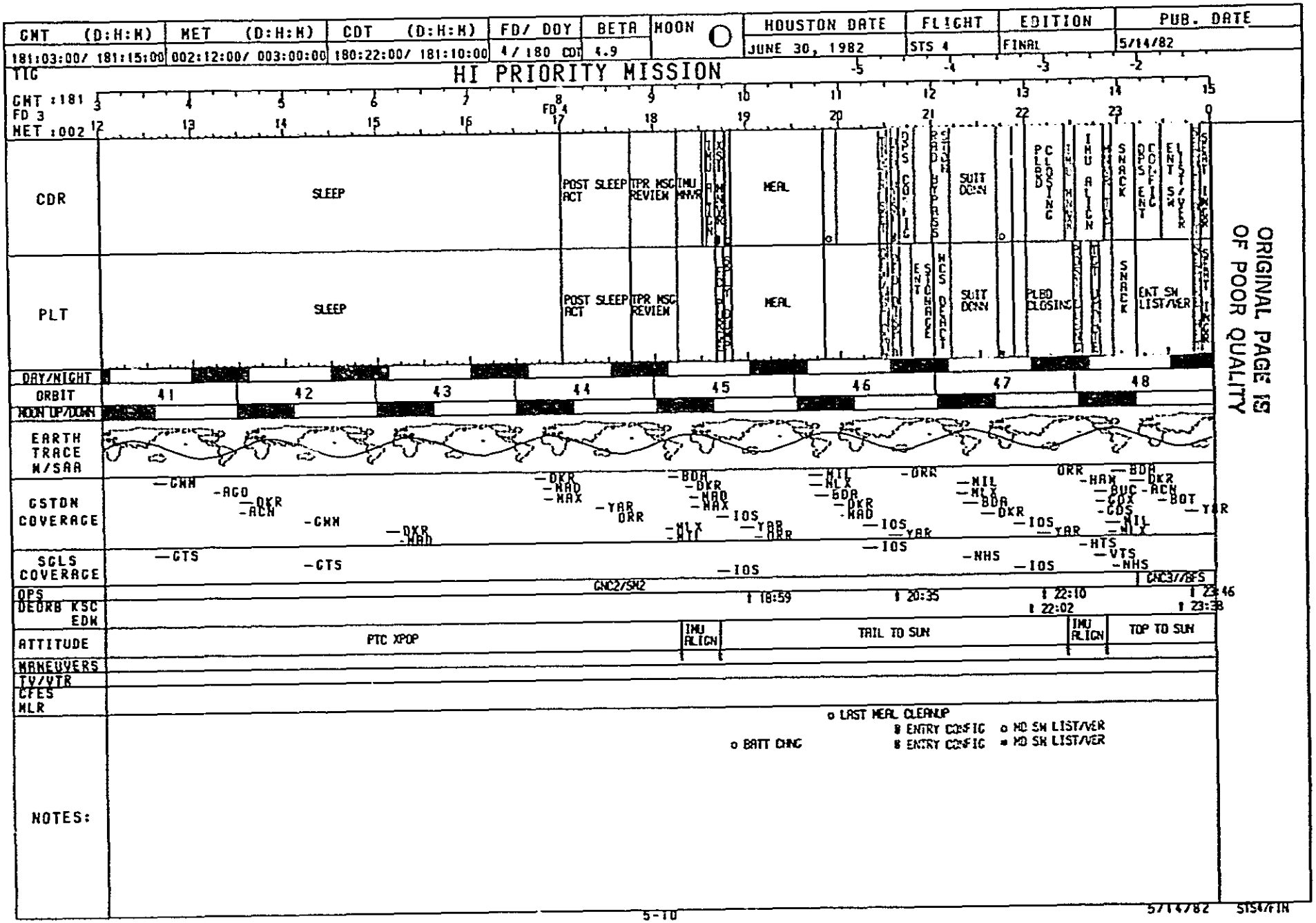
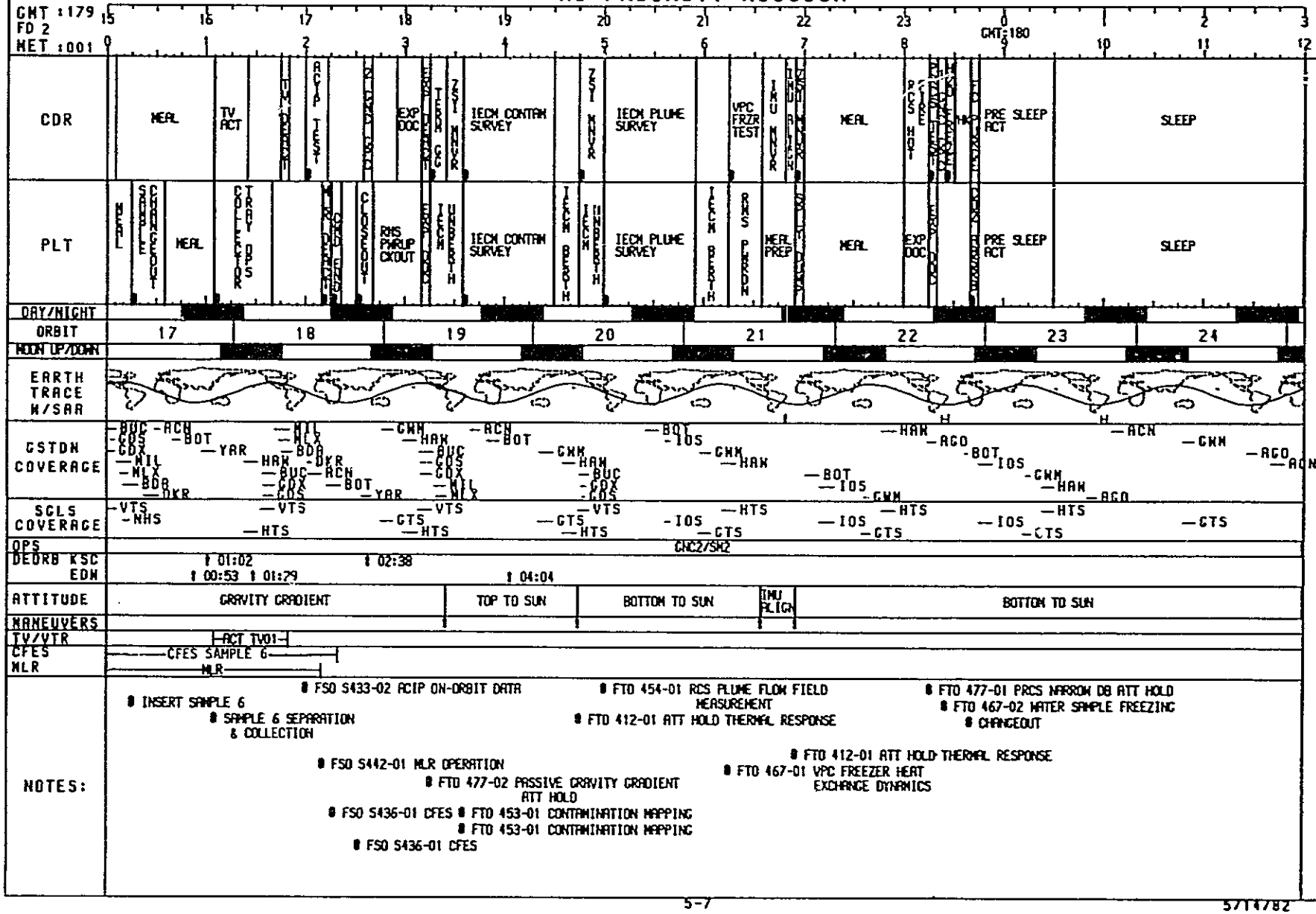

GMT (D:H:M) 180:15:00/ 181:03:00
MET (D:H:M) 002:00:00/ 002:12:00
CDT (D:H:M) 180:10:00/ 180:22:00
FD/ DOY 3/ 180 CDT
BETA 3.5
MOON
HOUSTON DATE JUNE 29, 1982
FLIGHT STS 4
EDITION FINAL
PUB. DATE 5/14/82
HI PRIORITY MISSION
GMT :180
FD 3
MET :002
GMT:181
CDR
PLT
MEAL
FCS CHECKOUT
PLBD CYCLE TEST
MEAL PREP
NOSL DEACT
CABIN STOW
PRE SACT
SLEEP
DAY/NIGHT
ORBIT
33
34
35
36
37
38
39
40
AOON UP/DOWN
EARTH TRACE W/SAA
GSTDN COVERAGE
SGLS COVERAGE
OPS
GNC2/SM2
C8/S2
DEORB KSC 01:12
EDW 01:03
02:39
ATTITUDE
IECH GAS RELEASE
BOTTOM TO SUN
JET
INU ALIGN
PTC XPOP
MANEUVERS
TV/VTR
CFES MLR
NOTES:
IECH GAS REL
FSO S431-01 IECH
FTO 412-01 ATT HOLD THERMAL RESPONSE
HI LOAD HTR-A
FTO 451-04 PLBD THERMAL GRADIENT PERFORMANCE
FSO S441-01 NOSL OPERATIONS
2 FHO BURN (30 SEC) (FTO 412-06)
HI LOAD HTR-OFF
CHANGEOUT
PL DEORBIT PREP
FSO S435-01 GAS OPERATION
FTO 412-01 ATT HOLD THERMAL RESPONSE
FSO S435-01 GAS OPERATION
CIRC PUMPS TO OFF


GMT (D:H:M)
MET (D:H:M)
CDT (D:H:M)
FD/ DOY
BETA
MOON
HOUSTON DATE
FLIGHT
EDITION
PUB. DATE
181:03:00/ 181:15:00
002:12:00/ 003:00:00
180:22:00/ 181:10:00
4 / 180 CDT
4.9
JUNE 30, 1982
STS 4
FINAL
5/14/82
TIG
HI PRIORITY MISSION
GMT :181
FD 3
MET :002
FD 4
CDR
PLT
SLEEP
POST SLEEP ACT
TPR MSG REVIEW
IMU ALIGN
MEAL
SUIT DOWN
PLBD CLOSING
SNACK
DAY/NIGHT
ORBIT
MOON UP/DOWN
EARTH TRACE W/SAA
GSTDN COVERAGE
GTS
GNC2/SM2
GNC3/BFS
OPS
DEORB KSC EDW
ATTITUDE
PTC XPOP
TAIL TO SUN
TOP TO SUN
MANEUVERS
TV/VTR
CFES
MLR
NOTES:
LAST MEAL CLEANUP
BATT CHG
ENTRY CONFIG
MID SW LIST/VER
ORIGINAL PAGE IS OF POOR QUALITY
5-10
5/14/82
STS4/FIN

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
179:15:00/ 180:03:00	001:00:00/ 001:12:00	179:10:00/ 179:22:00	2 / 179 CDT	0.9		JUNE 28, 1982	STS 4	FINAL	5/14/82

HI PRIORITY MISSION



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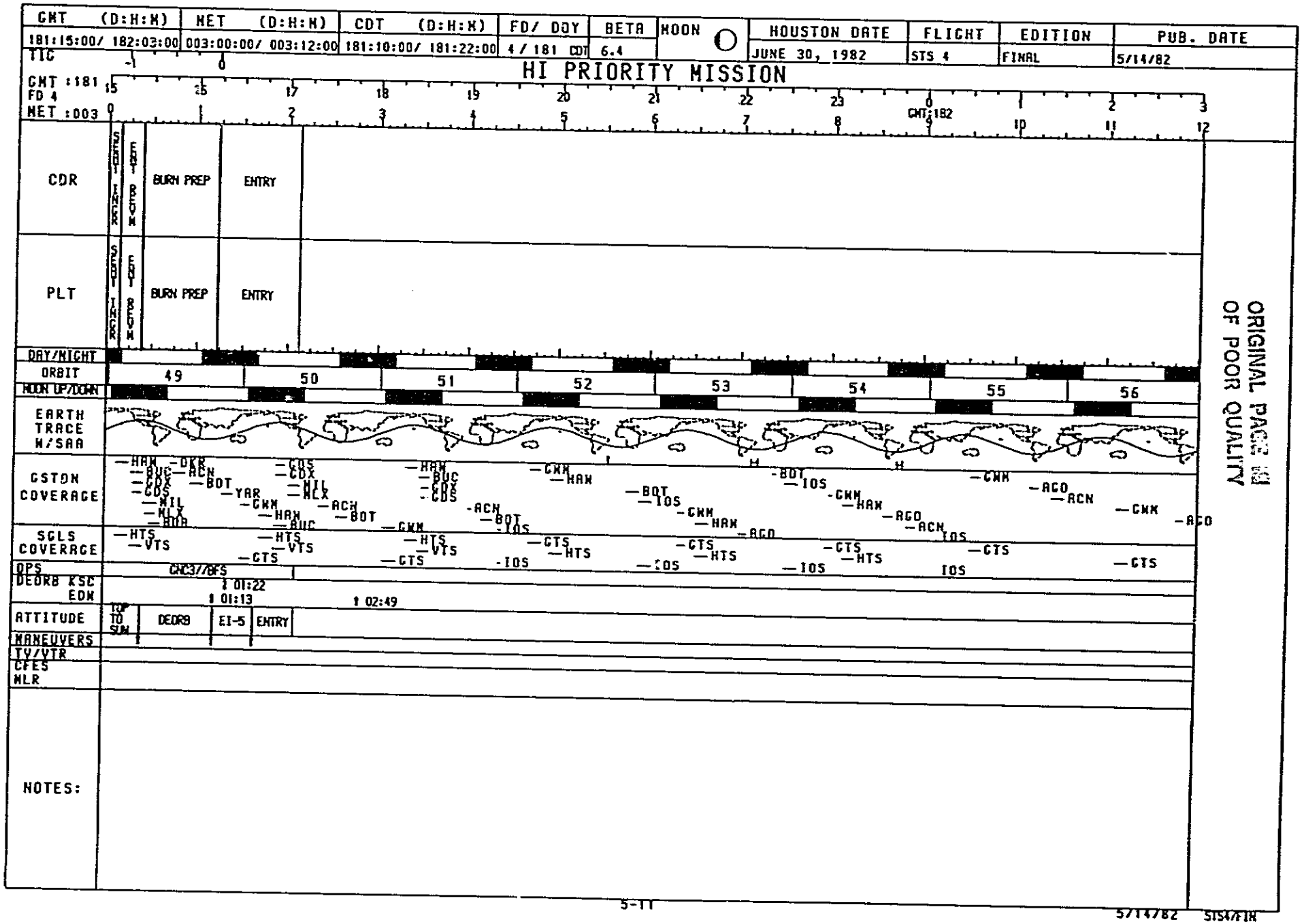
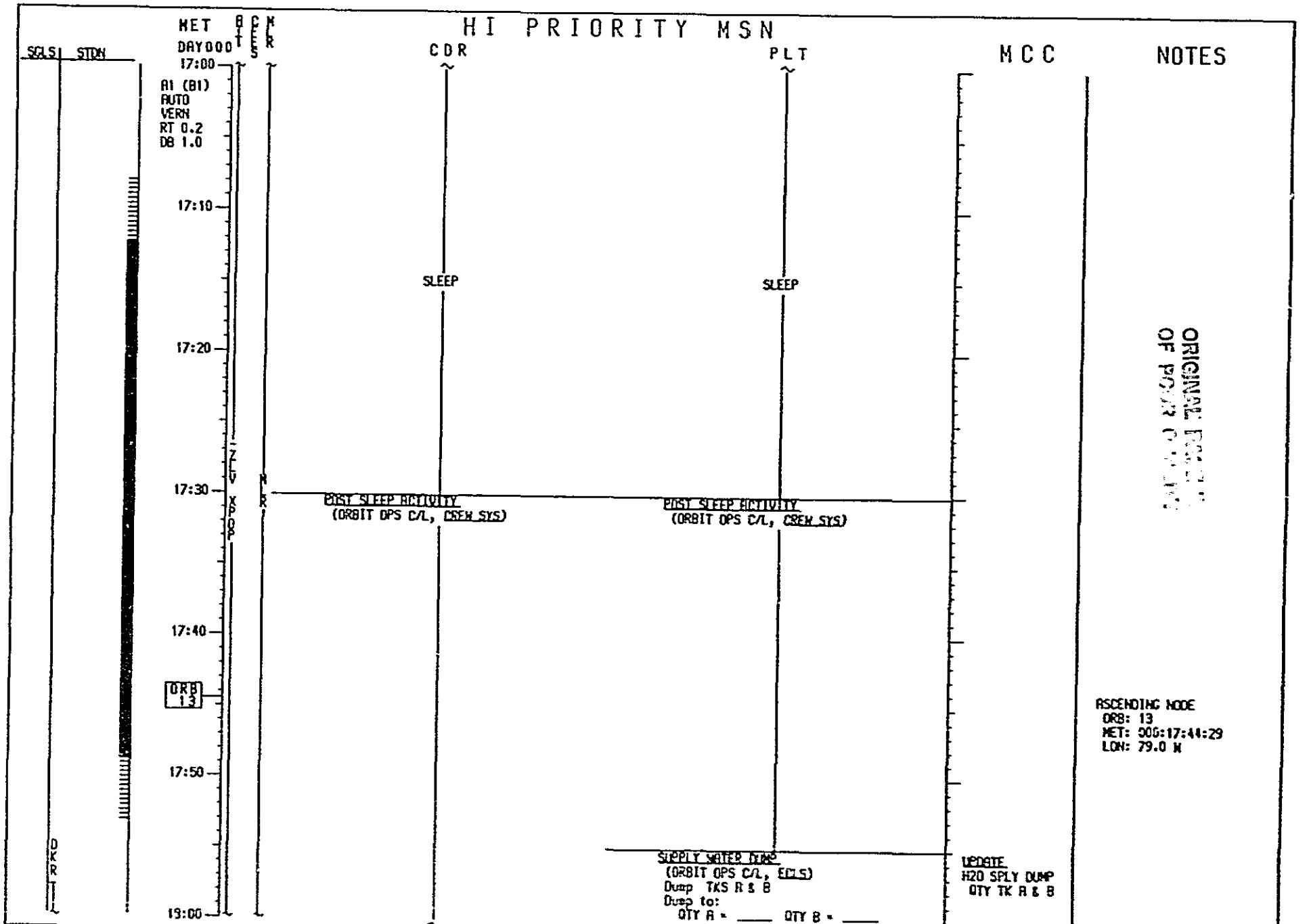
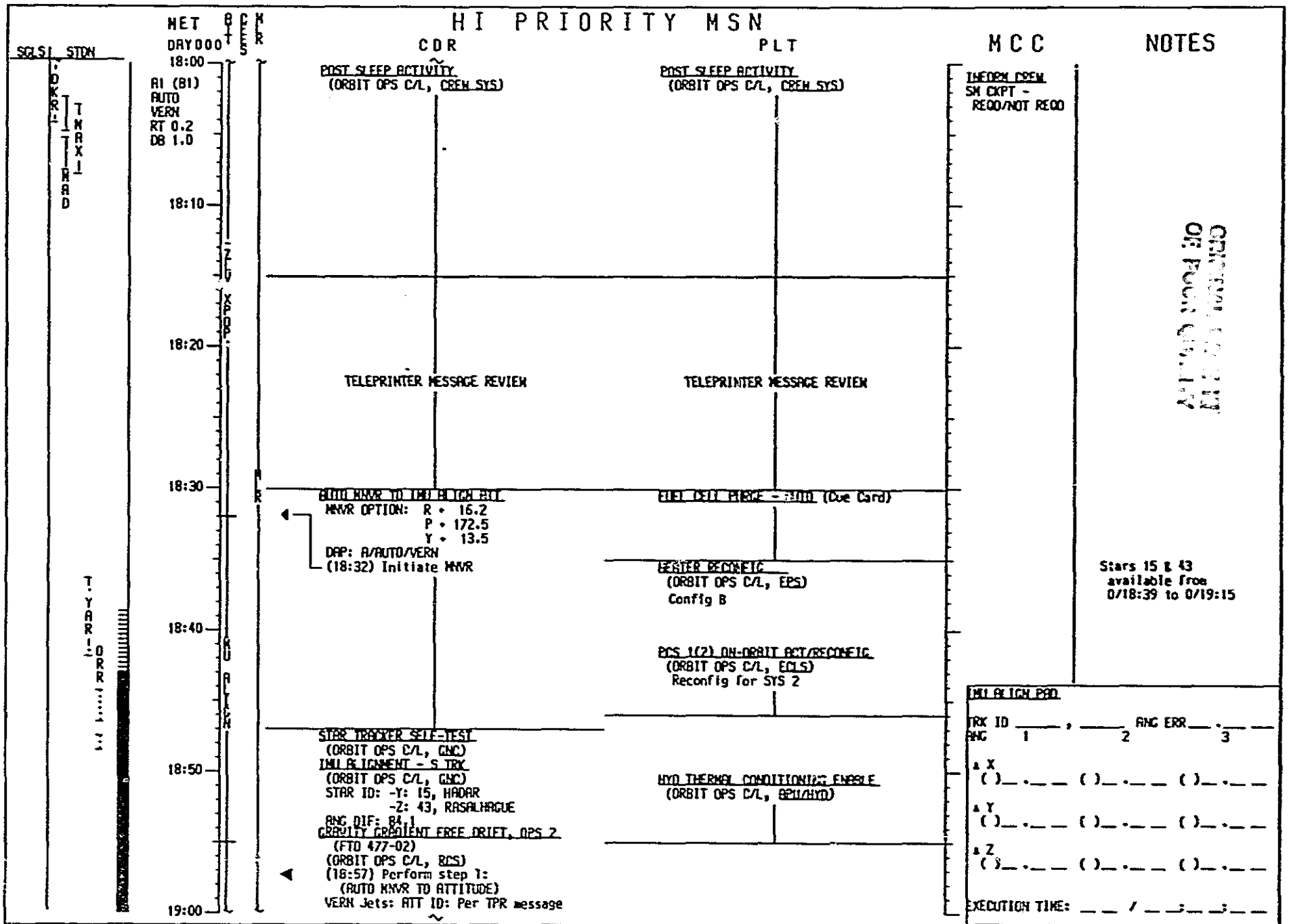
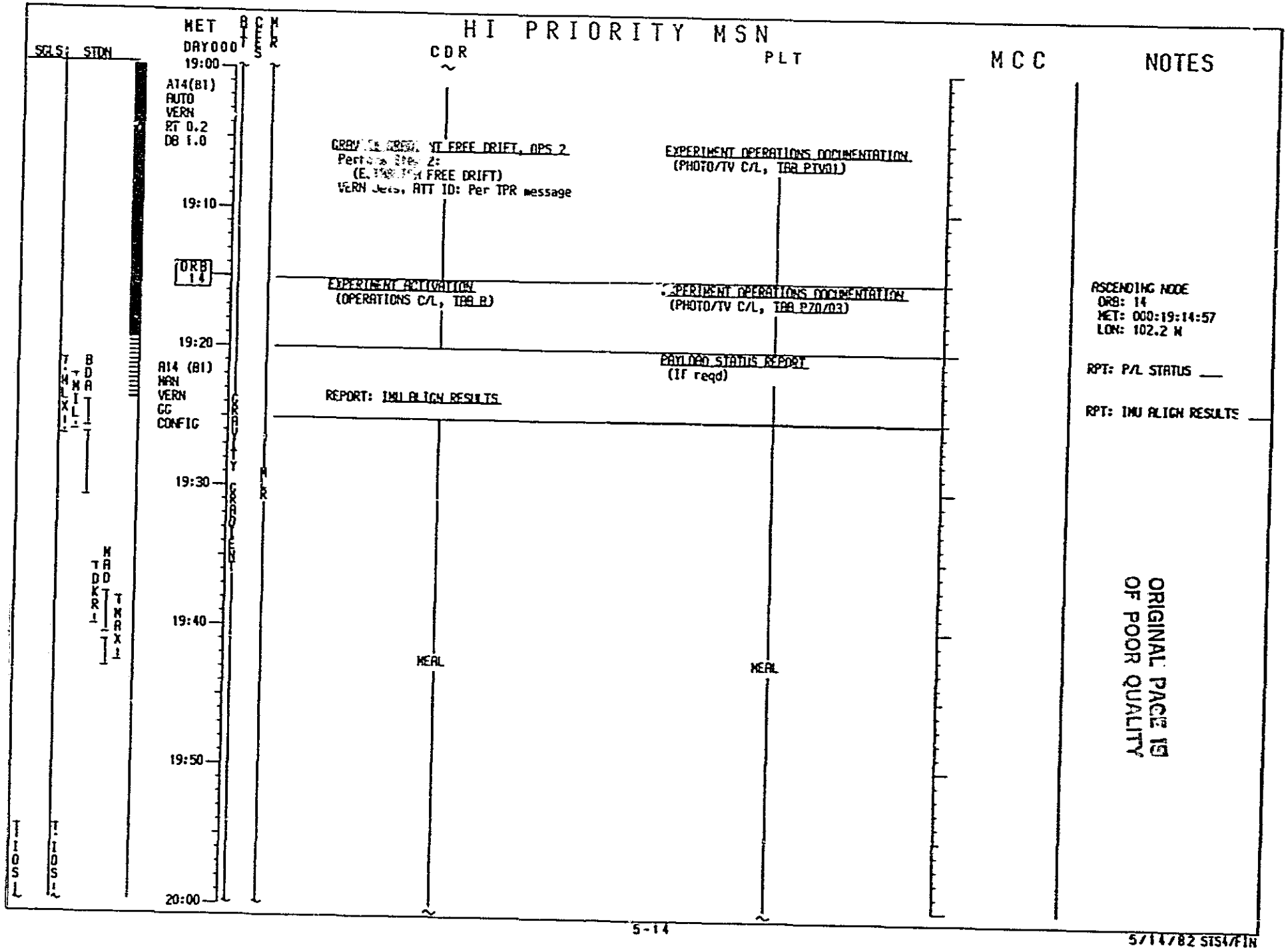

GMT (D:H:M)
MET (D:H:M)
CDT (D:H:M)
FD/ DOY
BETA
MOON
HOUSTON DATE
FLIGHT
EDITION
PUB. DATE
181:15:00/ 182:03:00
003:00:00/ 003:12:00
181:10:00/ 181:22:00
4 / 181 CDT
6.4
JUNE 30, 1982
STS 4
FINAL
5/14/82
TIC
HI PRIORITY MISSION
GMT :181
FD 4
MET :003
GMT:182
CDR
PLT
SCENT TNCR
EOT BRN
BURN PREP
ENTRY
DAY/NIGHT
ORBIT
49
50
51
52
53
54
55
56
MOON UP/DOWN
EARTH TRACE W/SAA
GSTDN COVERAGE
SGLS COVERAGE
OPS
DEORB KSC
EDW
GNC37/8FS
01:22
01:13
02:49
ATTITUDE
TOP TO SUN
DEORB
EI-5
ENTRY
MANEUVERS
TV/VTR
CFES
MLR
NOTES:
ORIGINAL PAGE IS
OF POOR QUALITY
5-11
5/14/82
STS4/FIN


HI PRIORITY MSN
MET
DAY 000
17:00
17:10
17:20
17:30
17:40
17:50
19:00
SGLS
STDN
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
ORB 13
CDR
PLT
MCC
NOTES
SLEEP
SLEEP
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS R & B
Dump to:
QTY A = ____ QTY B = ____
UPDATE
H2O SPLY DUMP
QTY TK R & B
ASCENDING NODE
ORB: 13
MET: 000:17:44:29
LON: 79.0 W
ORIGINAL PAGE IS OF POOR QUALITY
5/14/82 STS4/FIN


HI PRIORITY MSN
SGLS | STDN
MET
DAY 000
18:00
18:10
18:20
18:30
18:40
18:50
19:00
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
CDR
PLT
MCC
NOTES
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
TELEPRINTER MESSAGE REVIEW
AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R • 16.2
P • 172.5
Y • 13.5
DAP: A/AUTO/VERN
(18:32) Initiate MNVR
STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 15, HADAR
-Z: 43, RASALHAGUE
RNG DIF: 84.1
GRAVITY GRADIENT FREE DRIFT, OPS 2
(FTD 477-02)
(ORBIT OPS C/L, RCS)
(18:57) Perform step 1:
(AUTO MNVR TO ATTITUDE)
VERN Jets: ATT ID: Per TPR message
FUEL CELL PURGE - ####### (Cue Card)
ECLSS RECONFIG
(ORBIT OPS C/L, EPS)
Config B
RCS 1(2) ON-ORBIT ACT/RECONFIG
(ORBIT OPS C/L, ECLS)
Reconfig for SYS 2
HYD THERMAL CONDITIONING ENABLE
(ORBIT OPS C/L, APU/HYD)
THEORM CREW
SM CXPT -
REQD/NOT REQD
Stars 15 & 43
available free
0/18:39 to 0/19:15
IMU ALIGN PAD
TRK ID ____, ____
RNG 1 2
RNG ERR __.__
3
Δ X
( )__.__ ( )__.__ ( )__.__
Δ Y
( )__.__ ( )__.__ ( )__.__
Δ Z
( )__.__ ( )__.__ ( )__.__
EXECUTION TIME: __ __ / __ __:__ __:__ __



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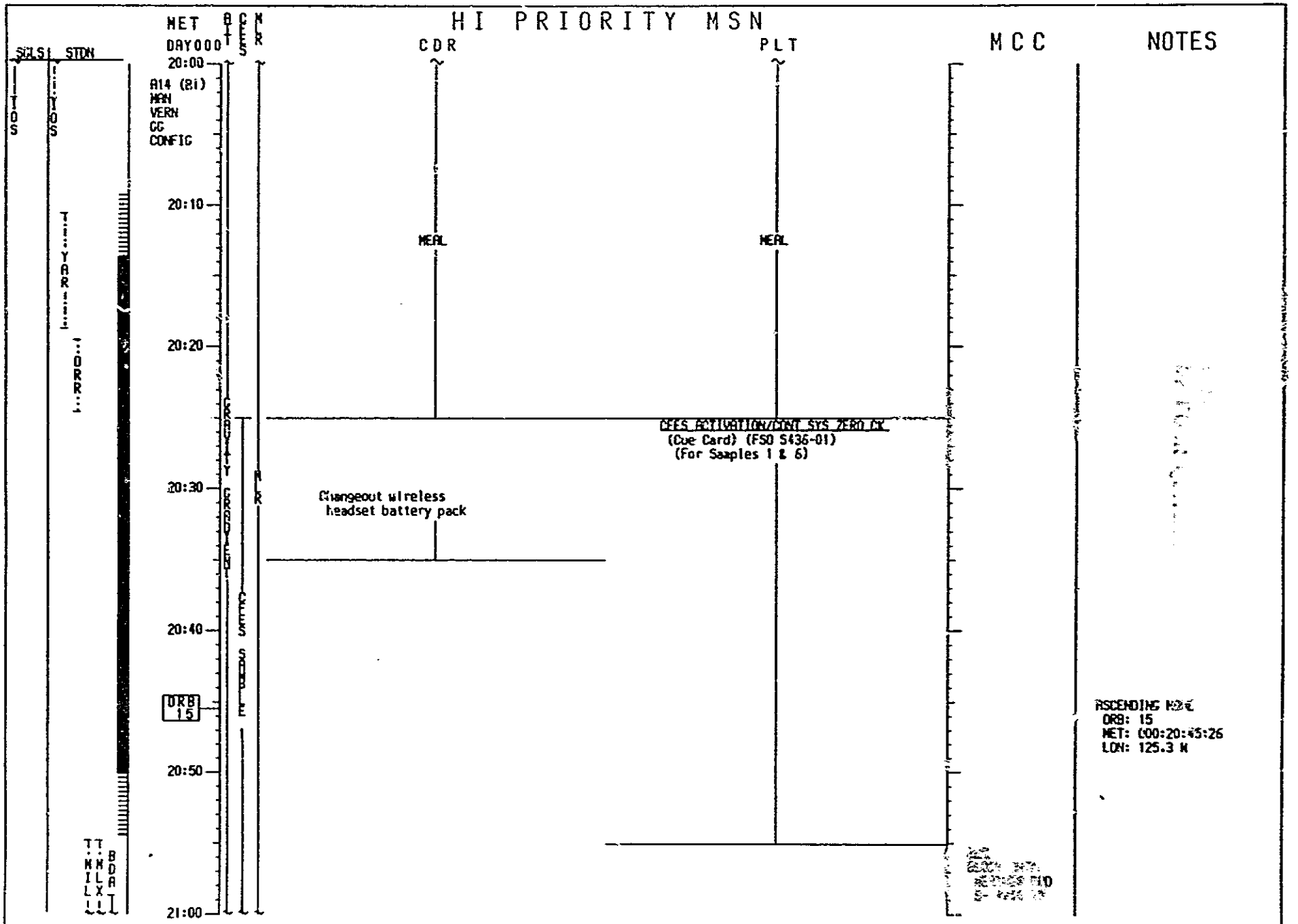
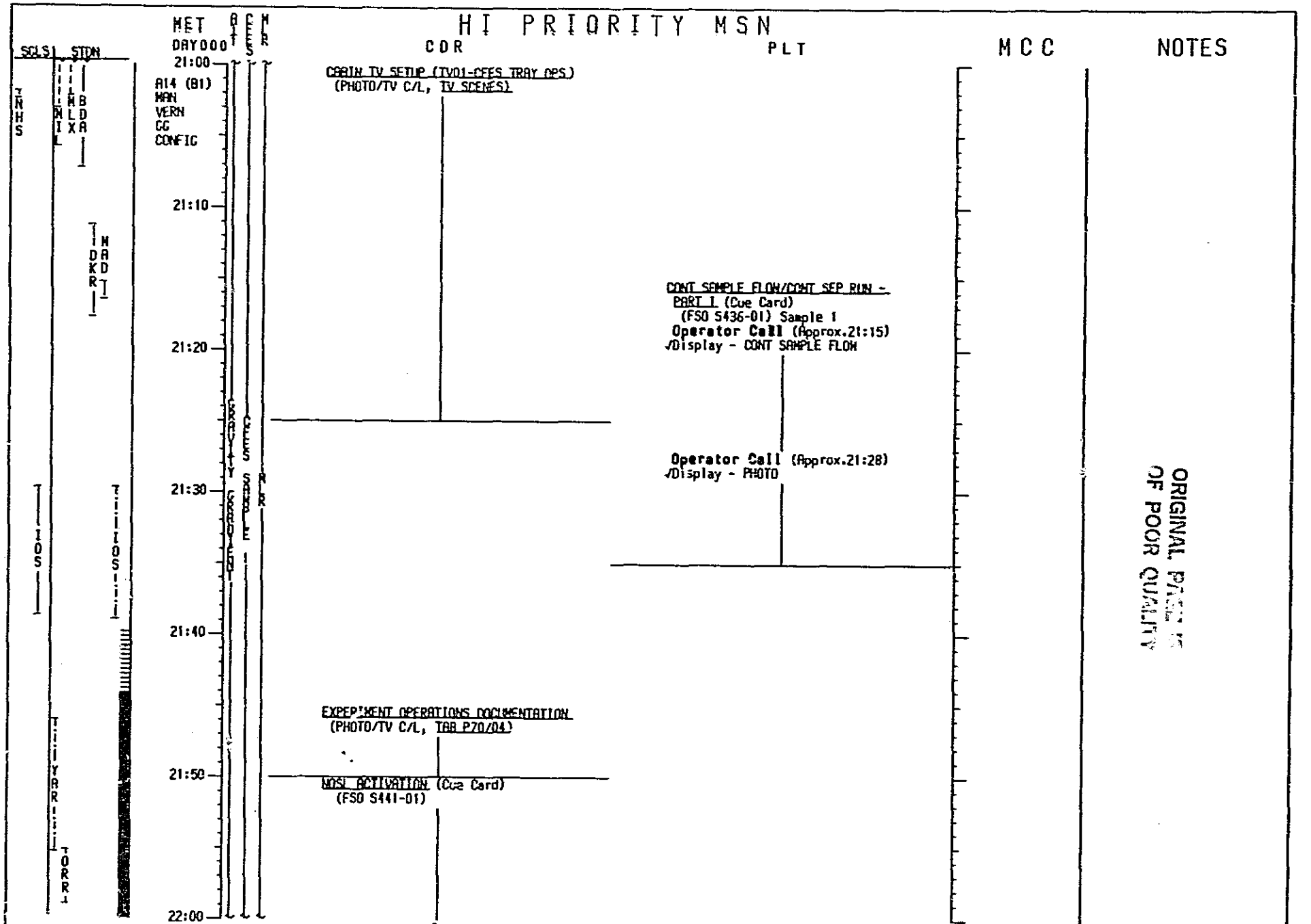
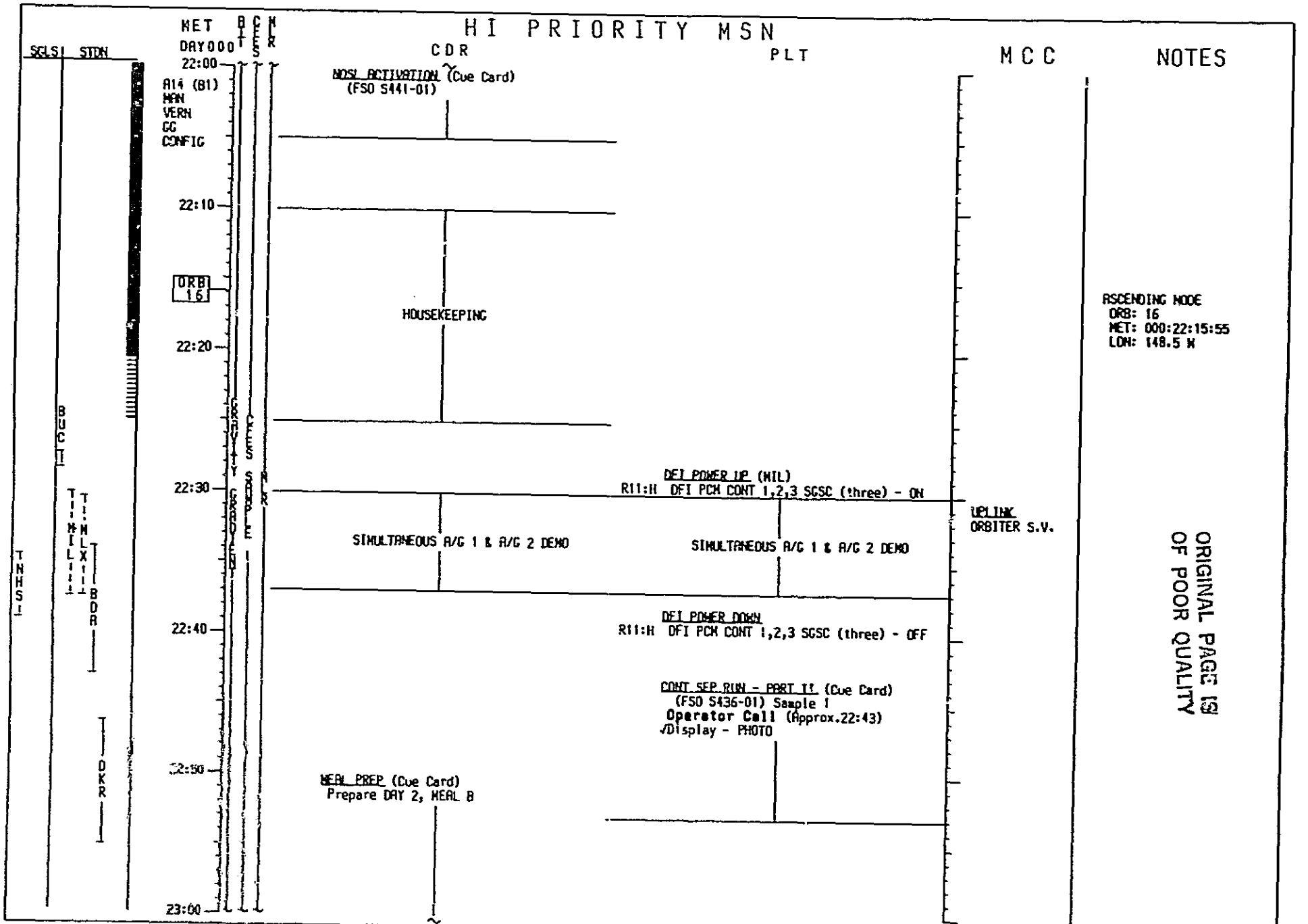
OF POOR QUALITY

5/14/82 SIS4/FIN

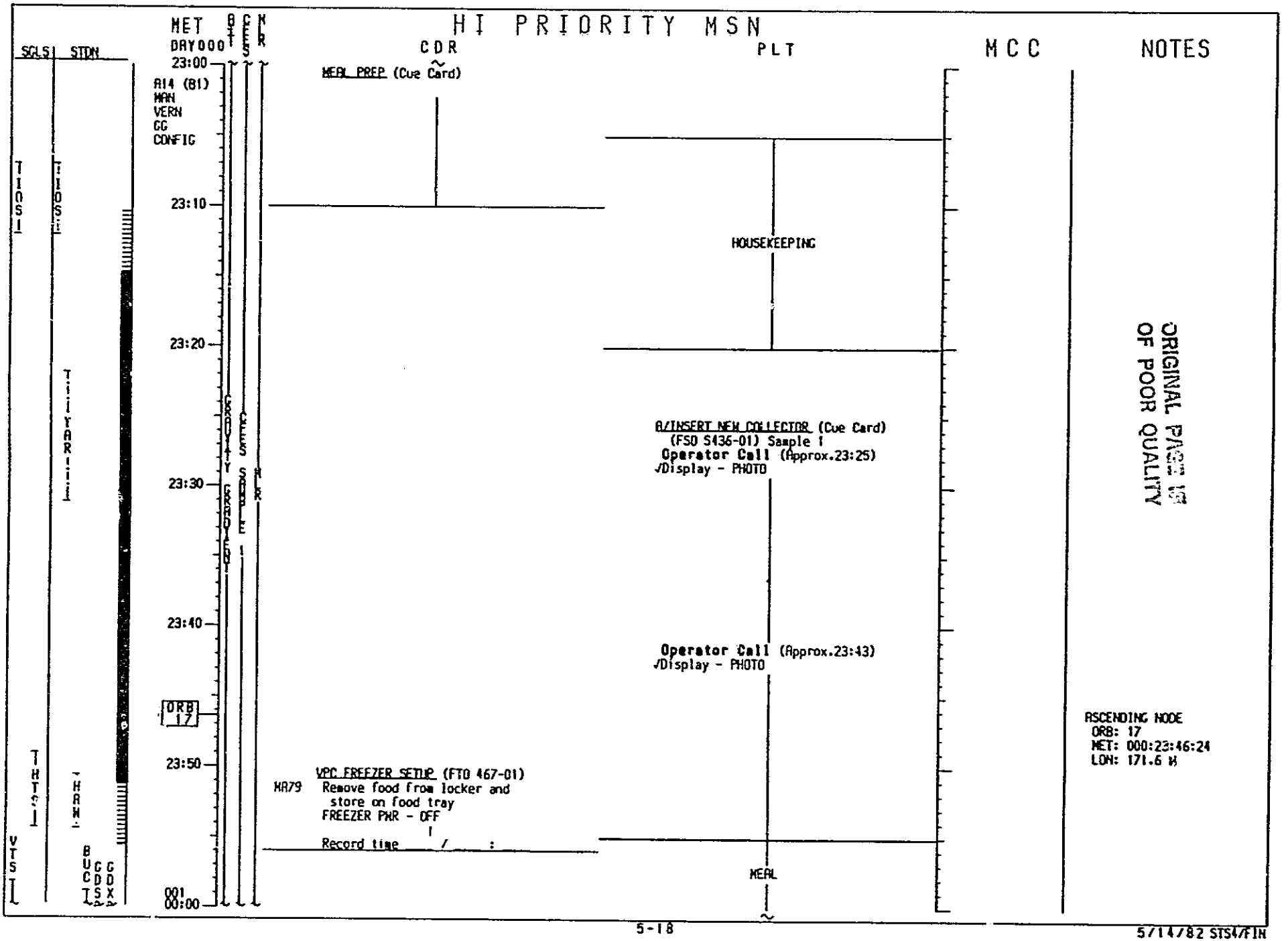

HI PRIORITY MSN
MET
DAY000
SGLS
STDN
TDS
TDS
T:::YR:::::::::DRR:::
T:::MILL:::
T:::MILX:::
BOA
20:00
20:10
20:20
20:30
20:40
ORB 15
20:50
21:00
A14 (8i)
MAN
VERN
CG
CONFIG
CDR
PLT
MCC
NOTES
MEAL
MEAL
CEES ACTIVATION/CONT SYS ZERO GR
(Cue Card) (FSO S436-01)
(For Samples 1 & 6)
Changeout wireless
headset battery pack
ASCENDING NODE
ORB: 15
MET: 000:20:45:26
LON: 125.3 W
5-15
5/14/82 STS4/FIN

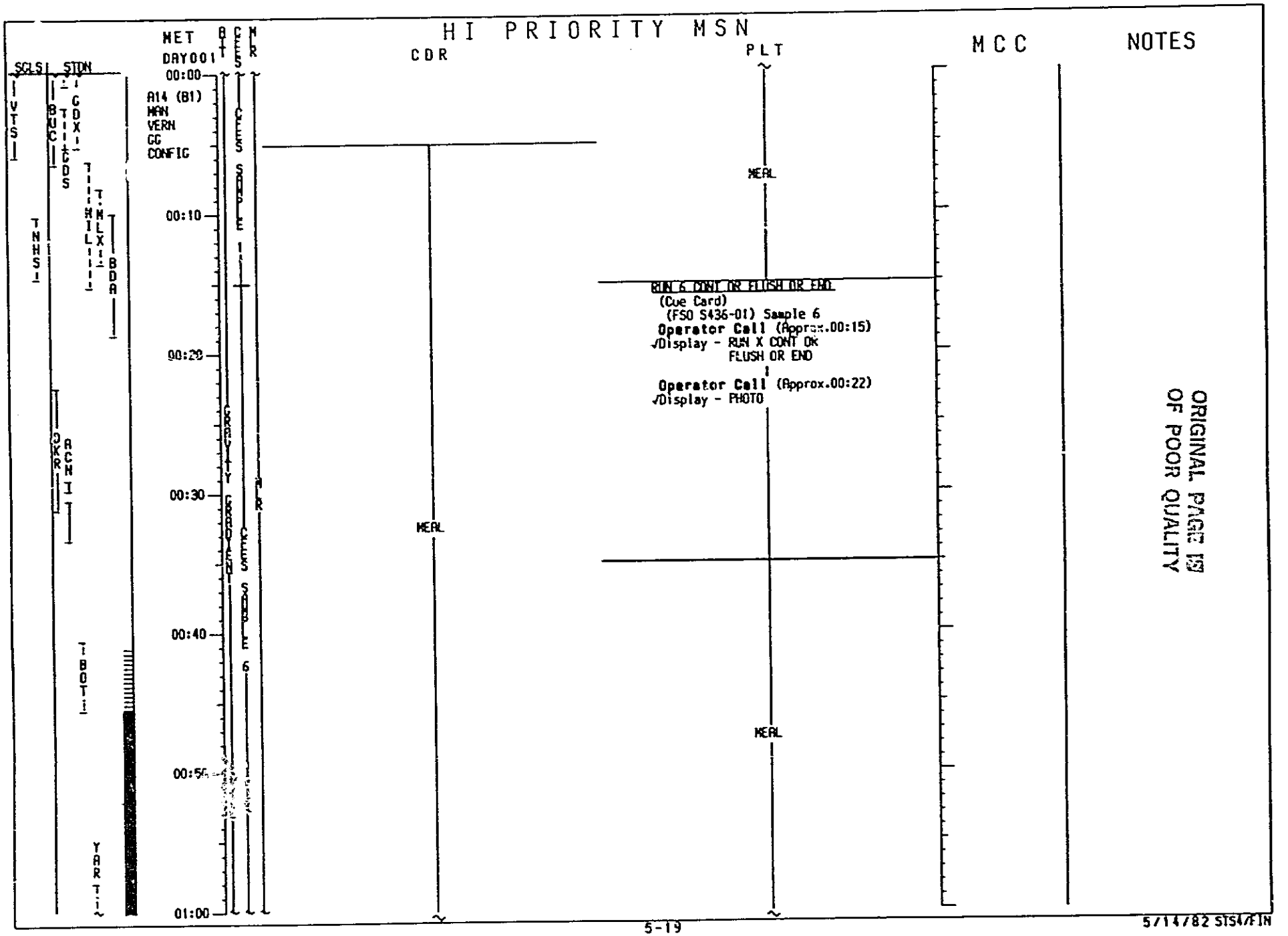


5/14/82 STS1/FIN



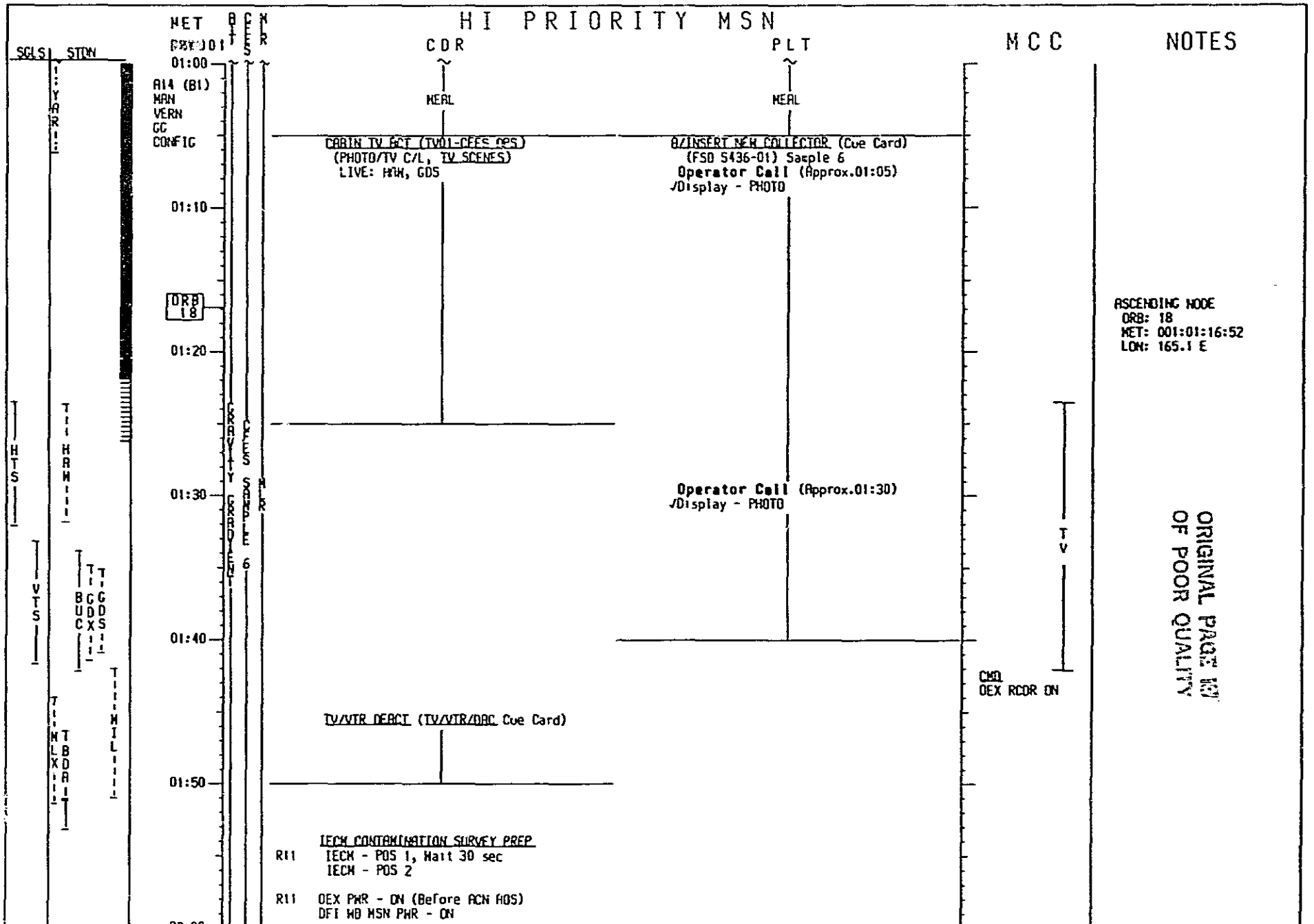
5/14/82 STS4/FIH


HI PRIORITY MSN
MET
DAY 000
SGLS
STDN
CDR
PLT
MCC
NOTES
23:00
23:10
23:20
23:30
23:40
23:50
001 00:00
ORB 17
A14 (81)
MAN
VERN
GG
CONFIG
MEAL PREP (Cue Card)
HOUSEKEEPING
A/INSERT NEW COLLECTOR (Cue Card)
(FSO S436-01) Sample 1
Operator Call (Approx.23:25)
√Display - PHOTO
Operator Call (Approx.23:43)
√Display - PHOTO
MEAL
VPC FREEZER SETUP (FTO 467-01)
MA79 Remove food from locker and
store on food tray
FREEZER PWR - OFF
Record time / :
ORIGINAL PAGE IS
OF POOR QUALITY
ASCENDING NODE
ORB: 17
MET: 000:23:46:24
LON: 171.6 W



ORIGINAL PAGE IS
OF POOR QUALITY

5/14/82 STS4/FIN



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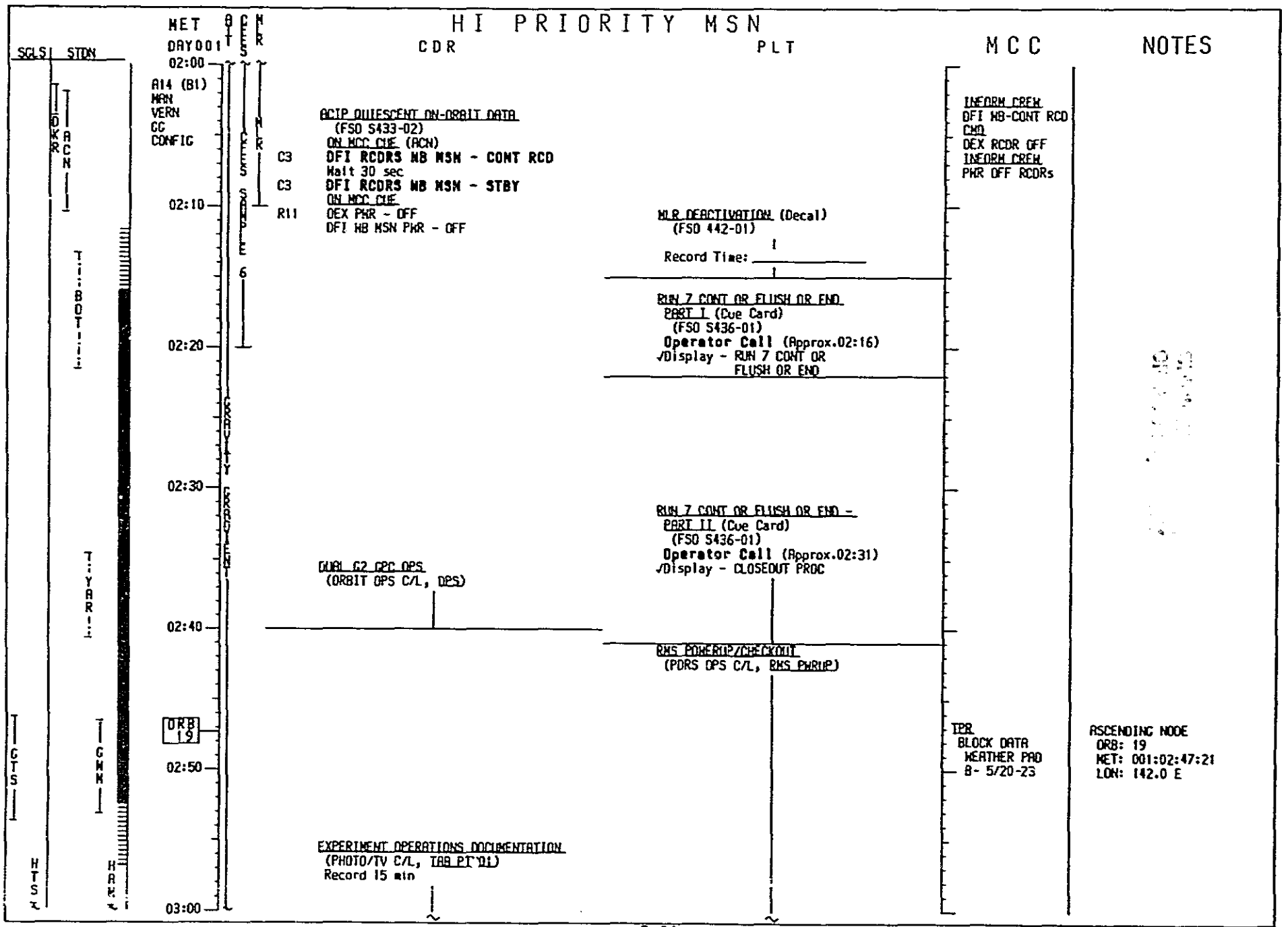
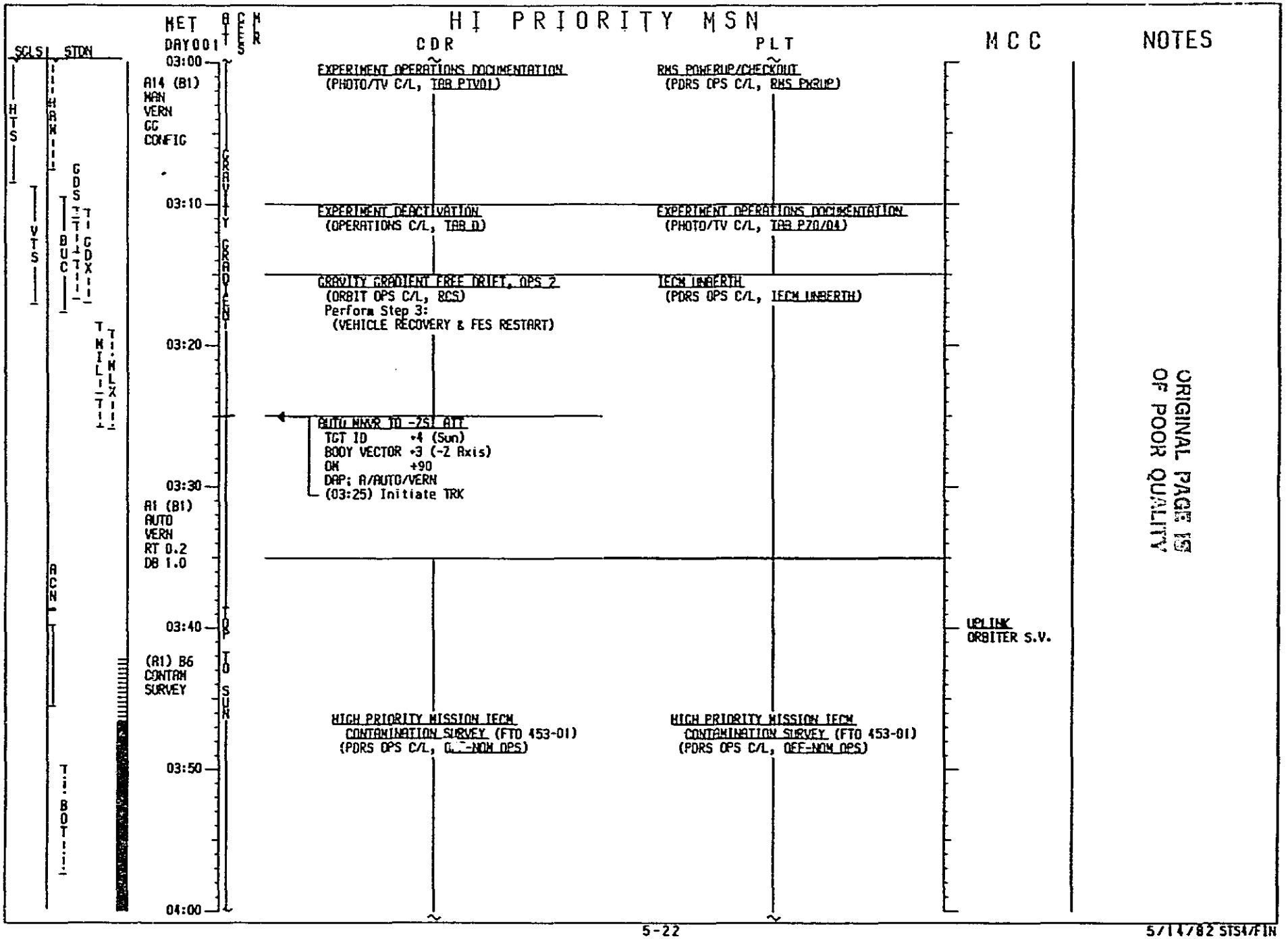
5/14/82 STS4/FIN


HI PRIORITY MSN
MET DAY001
CDR
PLT
MCC
NOTES
SGLS
STDN
02:00
02:10
02:20
02:30
02:40
02:50
03:00
A14 (B1)
MAN
VERN
CG
CONFIG
ACIP QUIESCENT ON-ORBIT DATA
(FSO S433-02)
ON MCC CUE (ACN)
C3 DFI RCDRS MB MSN - CONT RCD
Wait 30 sec
C3 DFI RCDRS MB MSN - STBY
ON MCC CUE
R11 OEX PWR - OFF
DFI MB MSN PWR - OFF
INFORM CREW
DFI MB-CONT RCD
CMD
OEX RCDR OFF
INFORM CREW
PWR OFF RCDRs
MLR DEACTIVATION (Decal)
(FSO 442-01)
Record Time:
RUN 7 CONT OR FLUSH OR END
PART I (Cue Card)
(FSO S436-01)
Operator Call (Approx.02:16)
√Display - RUN 7 CONT OR FLUSH OR END
DUAL G2 GPC OPS
(ORBIT OPS C/L, OPS)
RUN 7 CONT OR FLUSH OR END -
PART II (Cue Card)
(FSO S436-01)
Operator Call (Approx.02:31)
√Display - CLOSEOUT PROC
RMS POWERUP/CHECKOUT
(PDRS OPS C/L, RMS PWRUP)
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB PT'01)
Record 15 min
TPR
BLOCK DATA
WEATHER PRD
8- 5/20-23
ASCENDING NODE
ORB: 19
MET: 001:02:47:21
LON: 142.0 E
ORB 19
DKR
ACN
TDRS
GTS
GMT
HTSX
HAWX
ATT
ACCESS
MNVR
CREW SCHEDULE 6
GRAVITY GRADIENT



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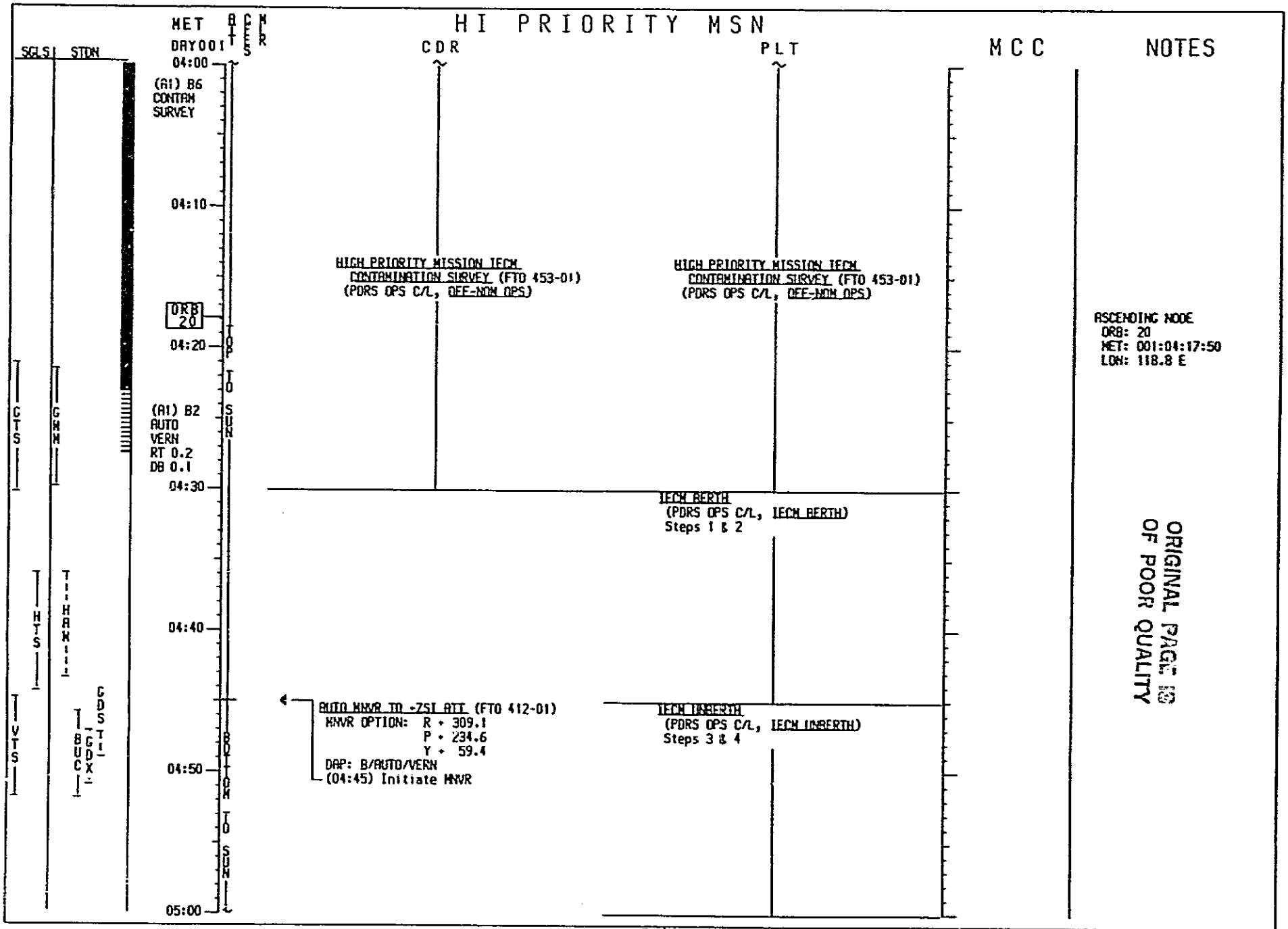
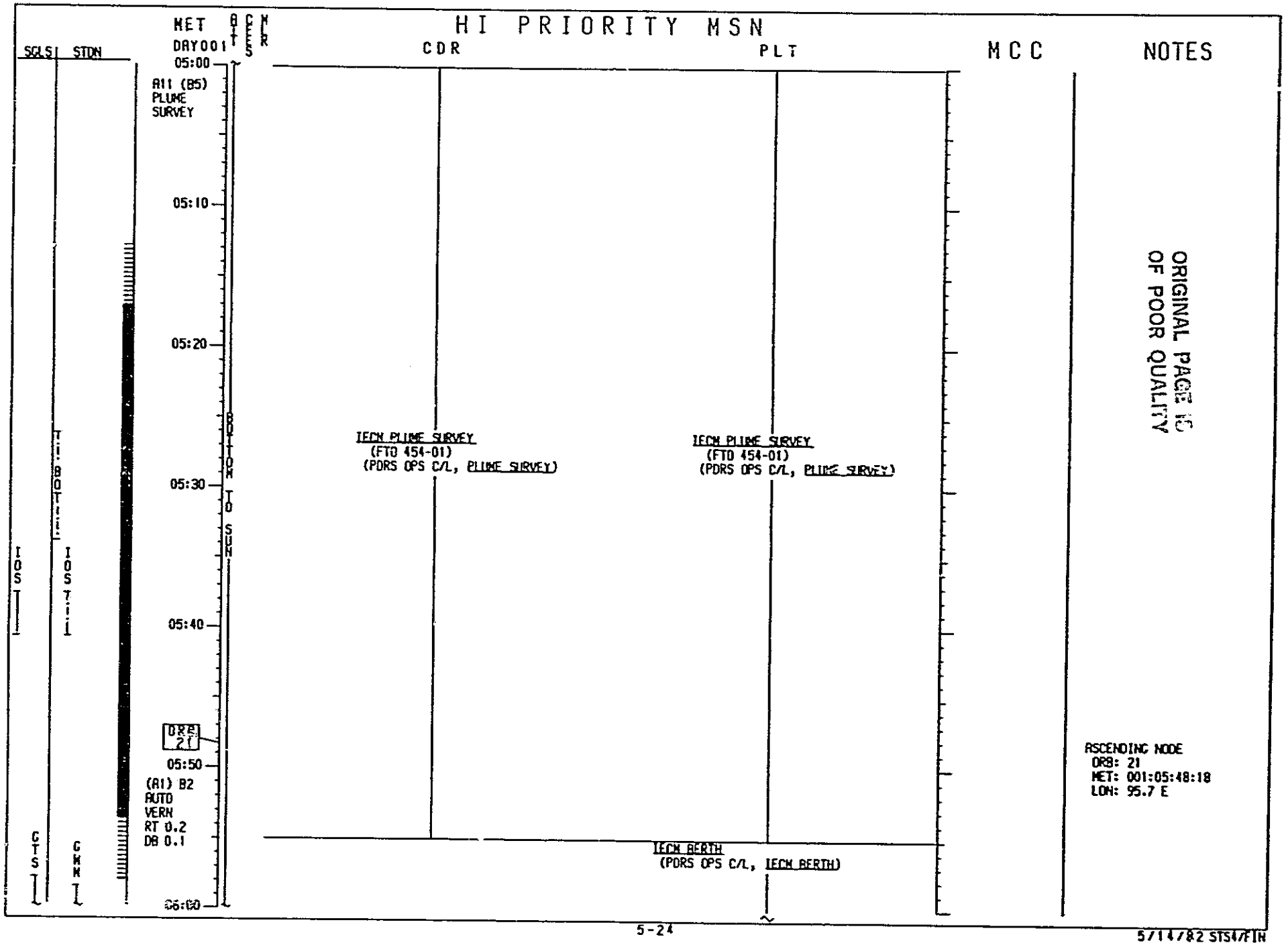
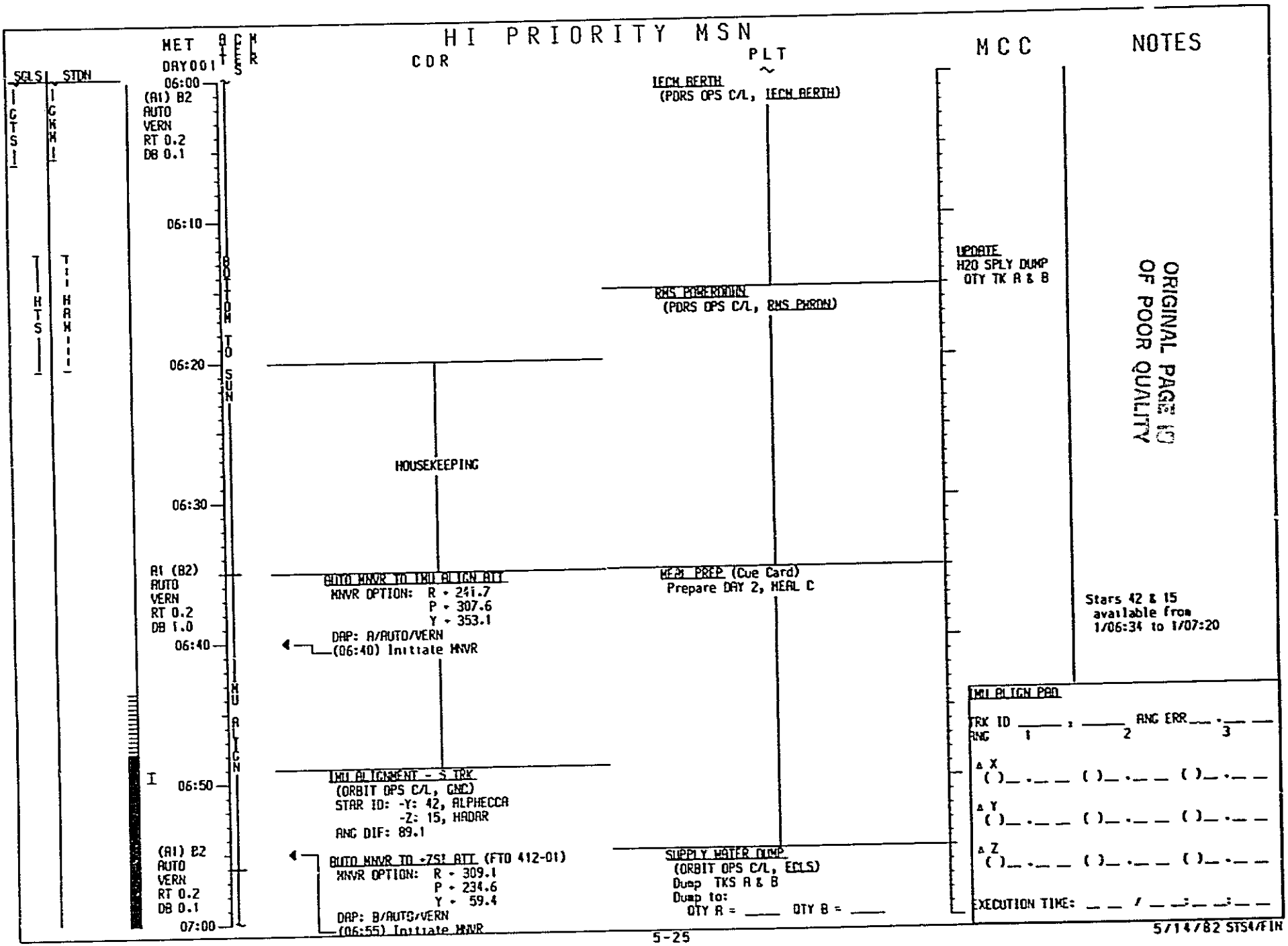
OF POOR QUALITY



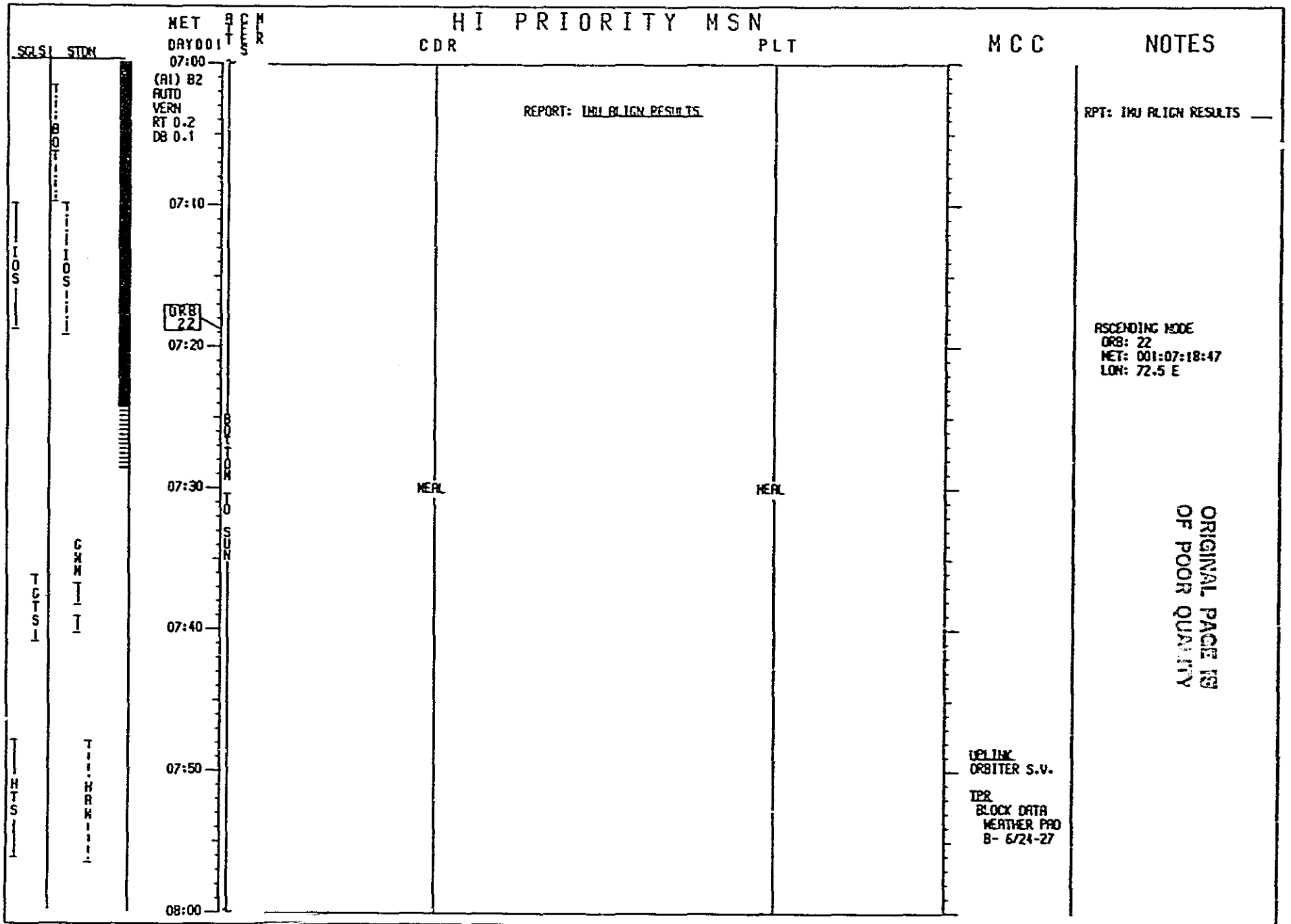
ORIGINAL PAGE IS
OF POOR QUALITY



5/14/82 STS4/FIN

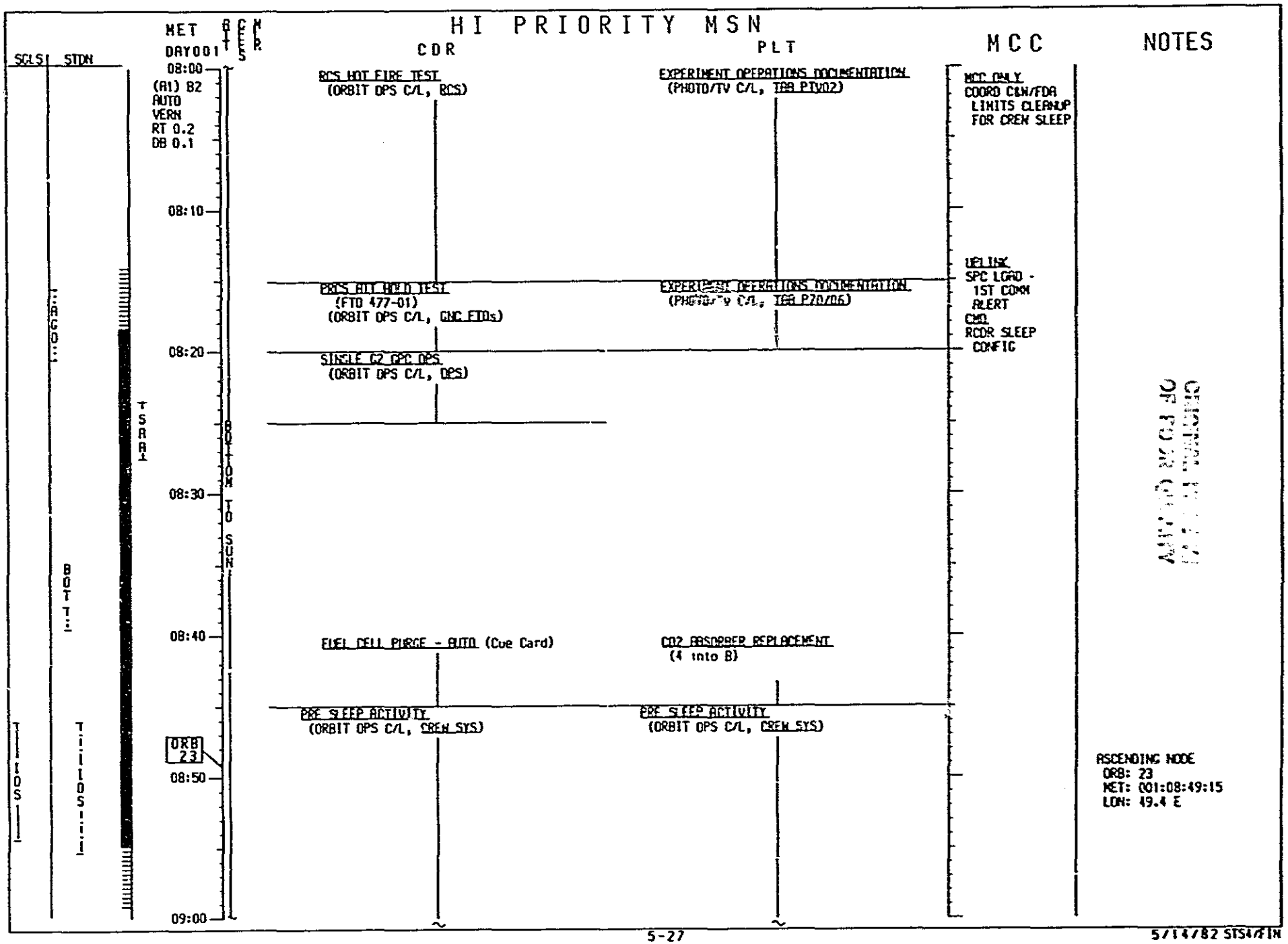


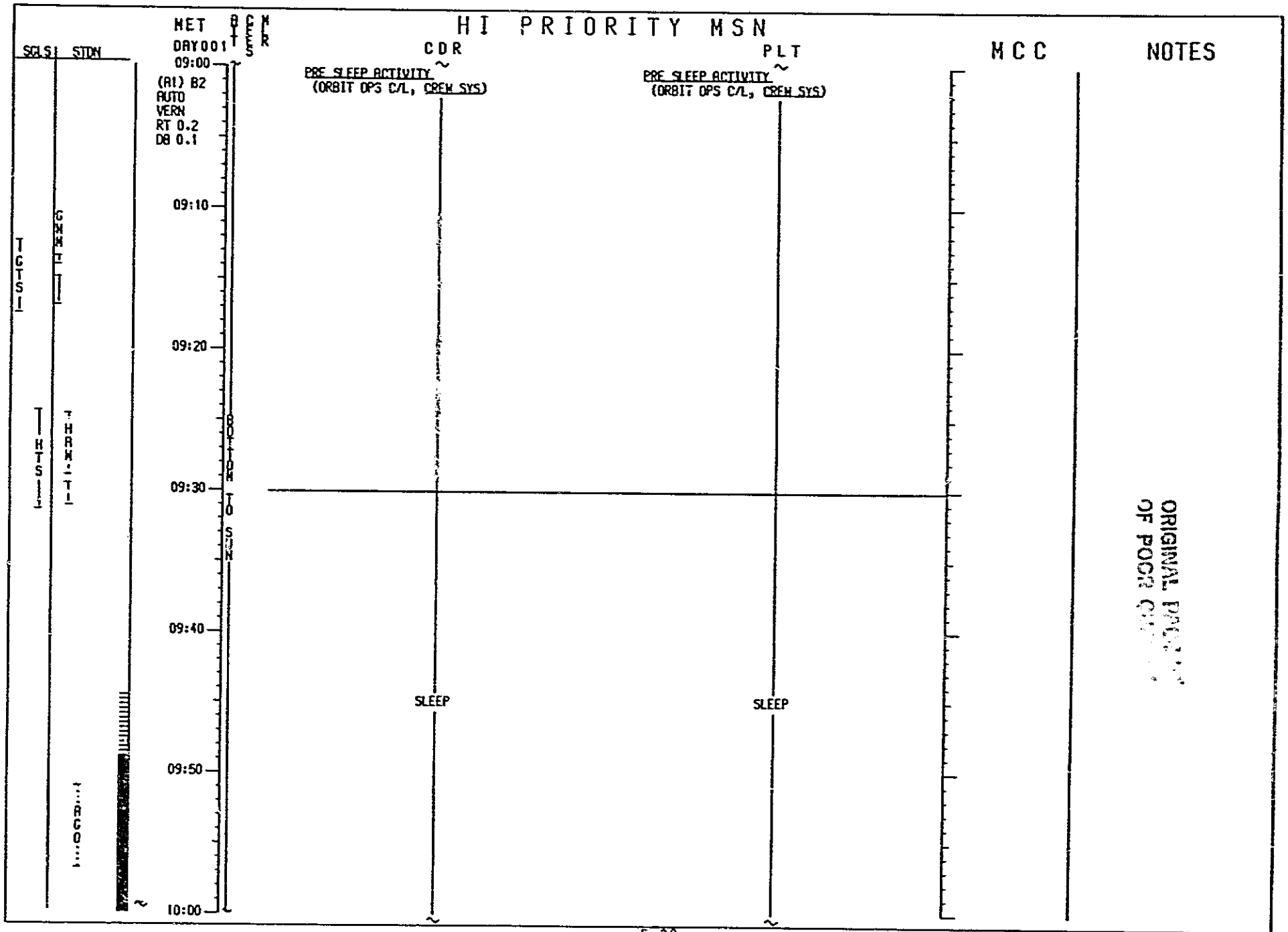
5/14/82 STS4/FIN



ORIGINAL PAGE IS
OF POOR QUALITY

5/14/82 STS4/FIN


HI PRIORITY MSN
MET
DAY001
GMT
SGLS
STDN
CDR
PLT
MCC
NOTES
08:00
08:10
08:20
08:30
08:40
08:50
09:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
RCS HOT FIRE TEST
(ORBIT OPS C/L, RCS)
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P7V02)
MCC ONLY
COORD C&W/FDA
LIMITS CLEANUP
FOR CREW SLEEP
PRCS AUT HOLD TEST
(FTD 477-01)
(ORBIT OPS C/L, GNC FTDs)
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P7D/M6)
UPLINK
SPC LOAD -
1ST COMM
ALERT
CWI
RCDR SLEEP
CONFIG
SINGLE G2 GPC OPS
(ORBIT OPS C/L, OPS)
FUEL CELL PURGE - AUTO (Cue Card)
CO2 ABSORBER REPLACEMENT
(4 into B)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
ORB
23
TSRAT
BOTTOM TO SUN
BOTTOS
TOS
ASCENDING NODE
ORB: 23
MET: 001:08:49:15
LON: 49.4 E



ORIGINAL PAGE IS
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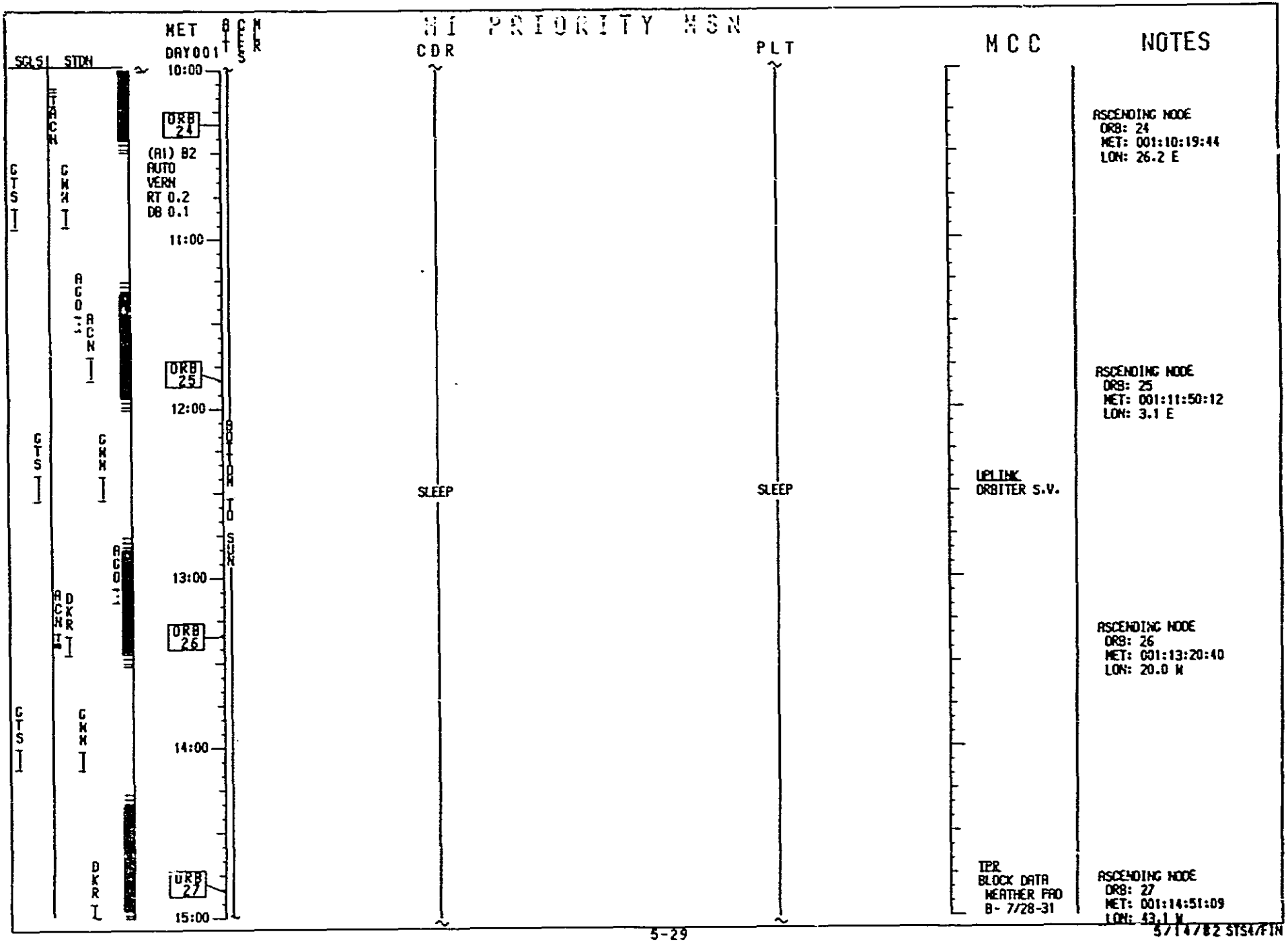

C-3

5-29

ORIGINAL PAGE IS
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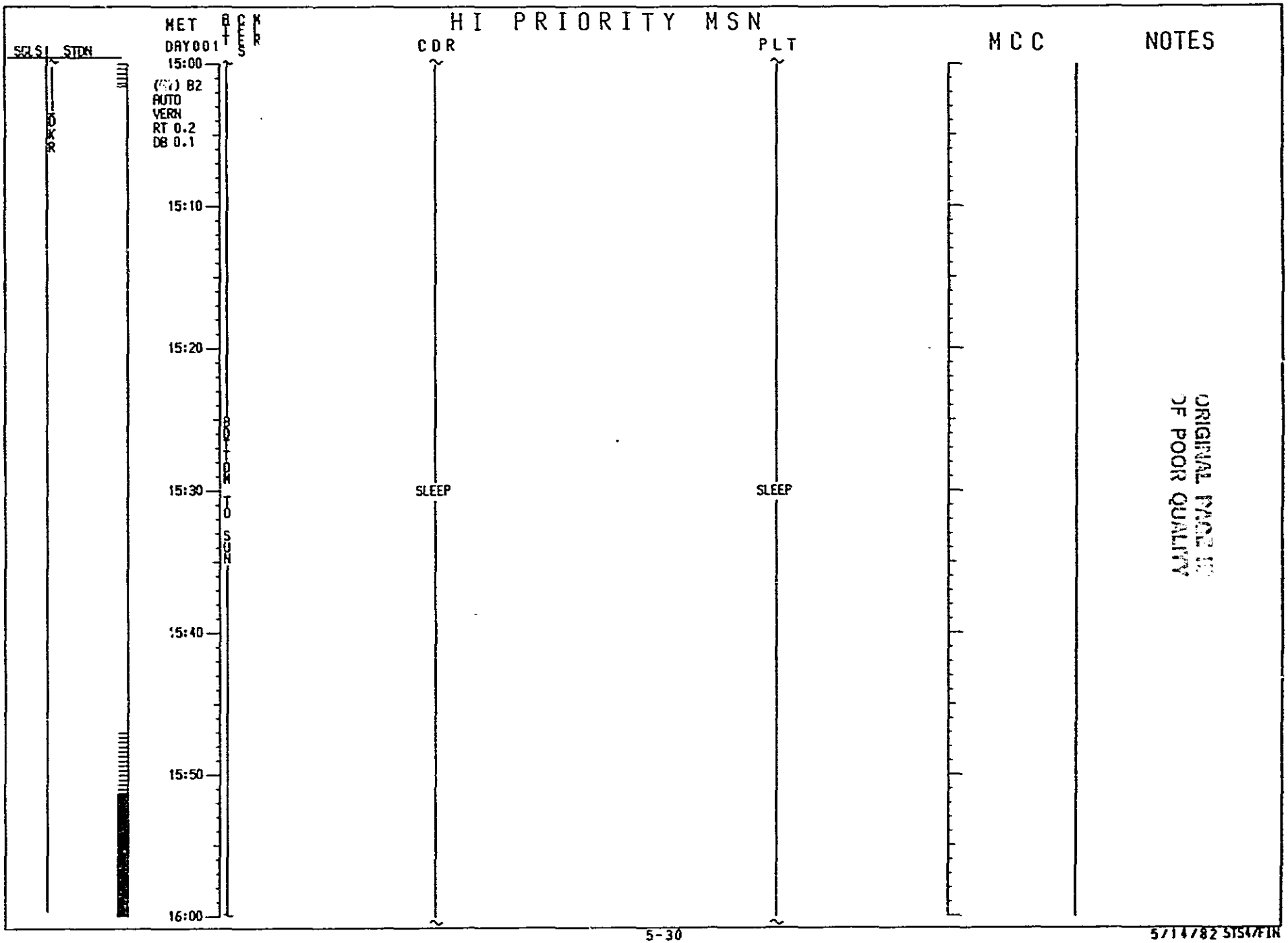
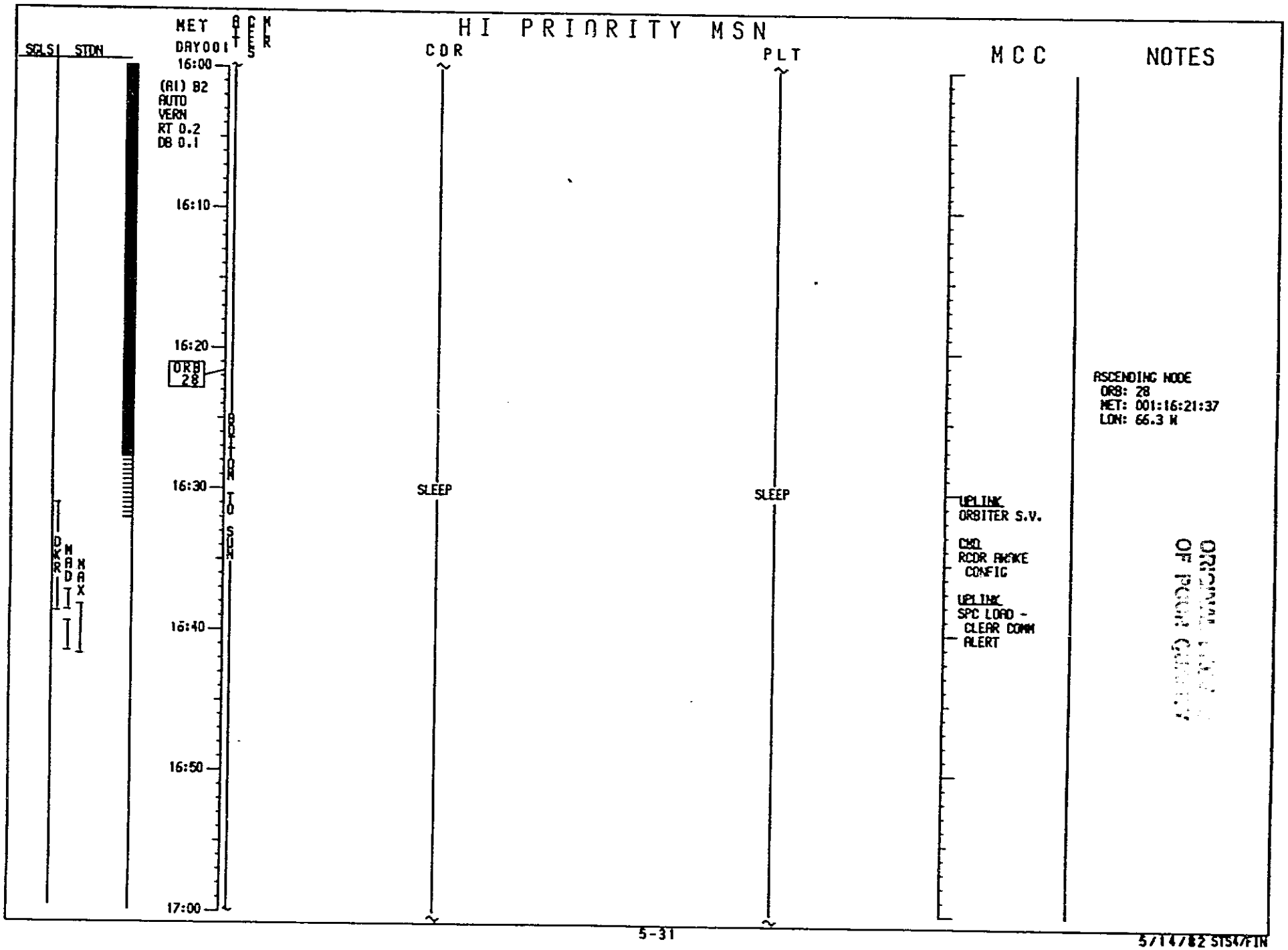
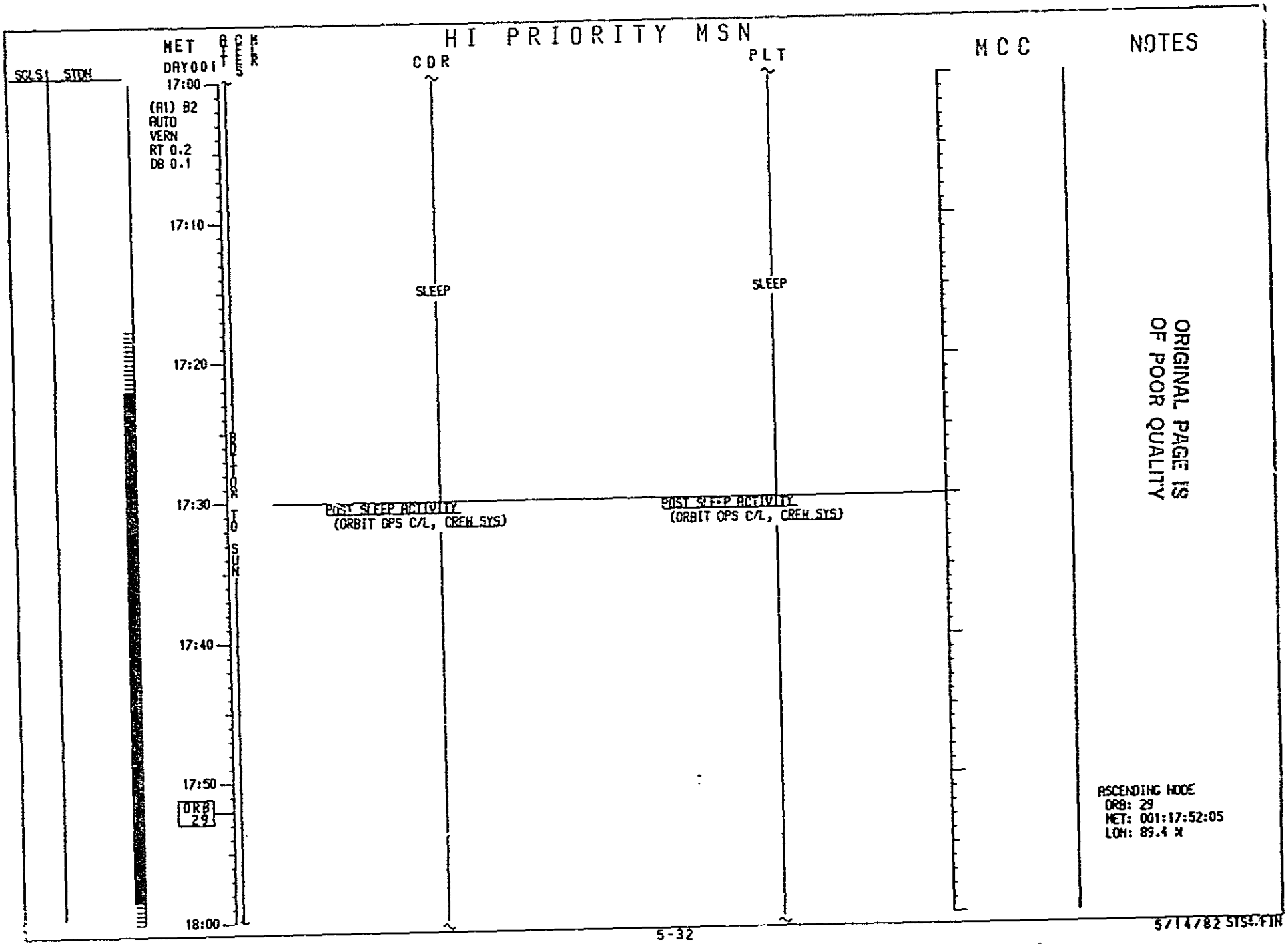
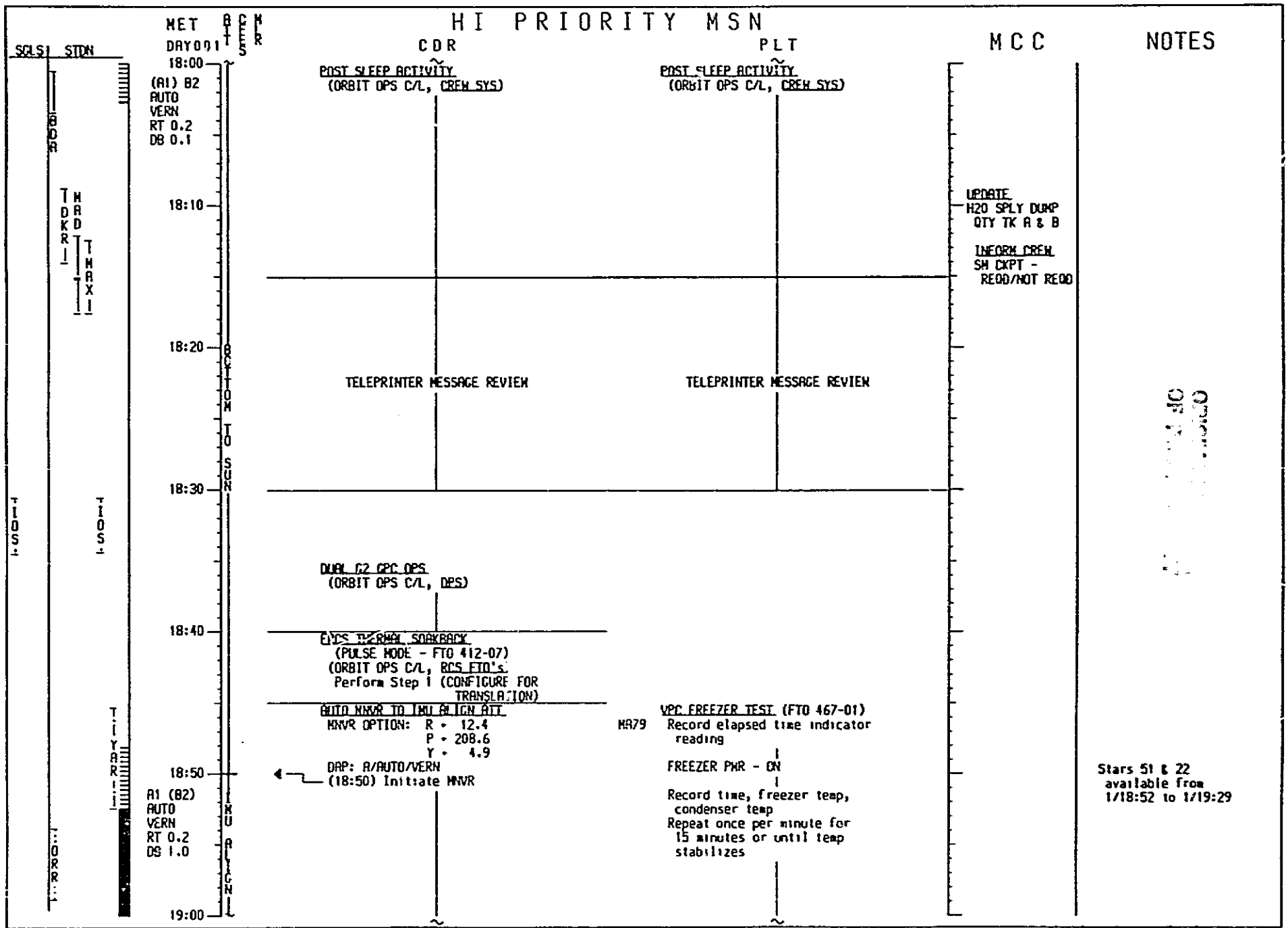


5/14/82 SISA/FIN


HI PRIORITY MSN
MET
DAY001
SELS
STDN
DKR
MAD
MAX
16:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
16:10
16:20
ORB
28
16:30
16:40
16:50
17:00
CDR
SLEEP
PLT
SLEEP
MCC
NOTES
UPLINK
ORBITER S.V.
CMD
RCDR RWAKE
CONFIG
UPLINK
SPC LOAD -
CLEAR COMM
ALERT
ASCENDING NODE
ORB: 28
MET: 001:16:21:37
LON: 66.3 W


HI PRIORITY MSN
MET
DAY 001
SCLS
STDN
17:00
17:10
17:20
17:30
17:40
17:50
18:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 29
CDR
PLT
SLEEP
SLEEP
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
MCC
NOTES
ORIGINAL PAGE IS
OF POOR QUALITY
ASCENDING NODE
ORB: 29
MET: 001:17:52:05
LON: 89.4 W
5/14/82 STS-FIN



5/14/82 STS4/FIN

HI PRIORITY MSN

SGLS | STDN

MET DAY001

19:00 — A1 (B2) AUTO VERN RT 0.2 DB 1.0

19:10 — (A1) B2 AUTO VERN RT 0.2 DB 0.1

19:20 — ORB 30

19:30

19:40

19:50

20:00

ACMR ATTEMPTS

KU ALIGN

BOTTOM TO SUN

MIL TILT TIMELINE

TDRS-W — BDA

TDRS-E — MAD — MAX

CDR

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 51, ATRIA
-Z: 22, ALTAIR
ANC DIF: 94.0

AUTO MNVR TO -ZSI ATT (FTO 412-01)
MNVR OPTION: R = 309.1
P = 234.6
Y = 59.4
DAP: B/AUTO/VERN
(19:10) Initiate MNVR

EC PURGE - MANUAL (Cue Card)

MEAL

REPORT: IMU ALIGN RESULTS

PLT

VPC FREEZER TEST (FTO 467-01)

WATER SAMPLE FREEZING
Mxxx Unstow H2O sample container and fill with H2O
MA96 Insert container into freezer,
Record time ___ / ___ : ___

Changeout wireless headset battery pack

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____

MEAL

MCC NOTES

IMU ALIGN PAD

TRK ID ____ , ____ ANG ERR __.__ __
ANG 1 2 3

Δ X
( )__.__ ( )__.__ ( )__.__

Δ Y
( )__.__ ( )__.__ ( )__.__

Δ Z
( )__.__ ( )__.__ ( )__.__

EXECUTION TIME: __ __ / __ __ : __ __ : __ __

ASCENDING NODE
ORB: 30
MET: 001:19:22:33
LON: 112.6 W

RPT: IMU ALIGN RESULTS ___

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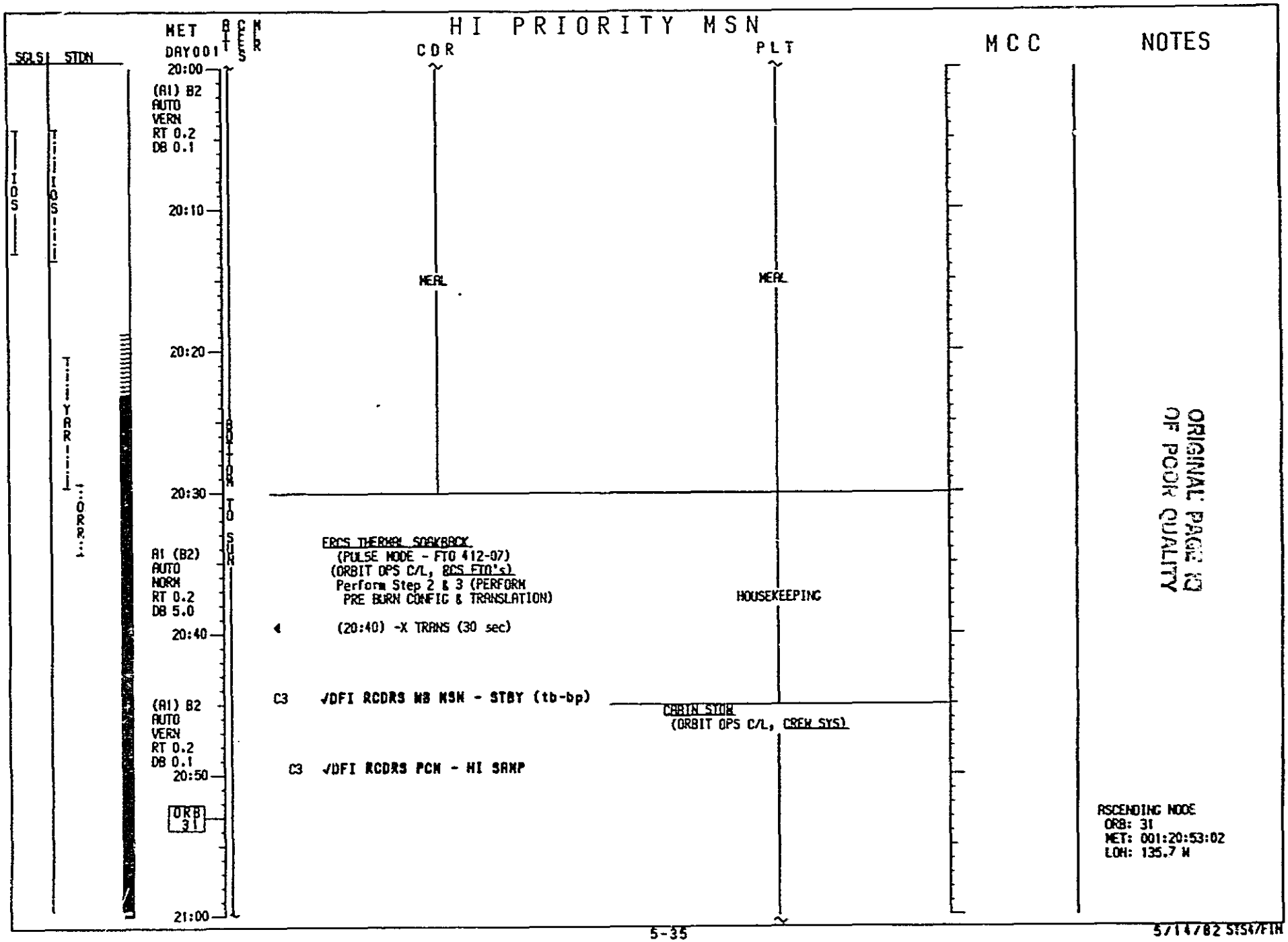
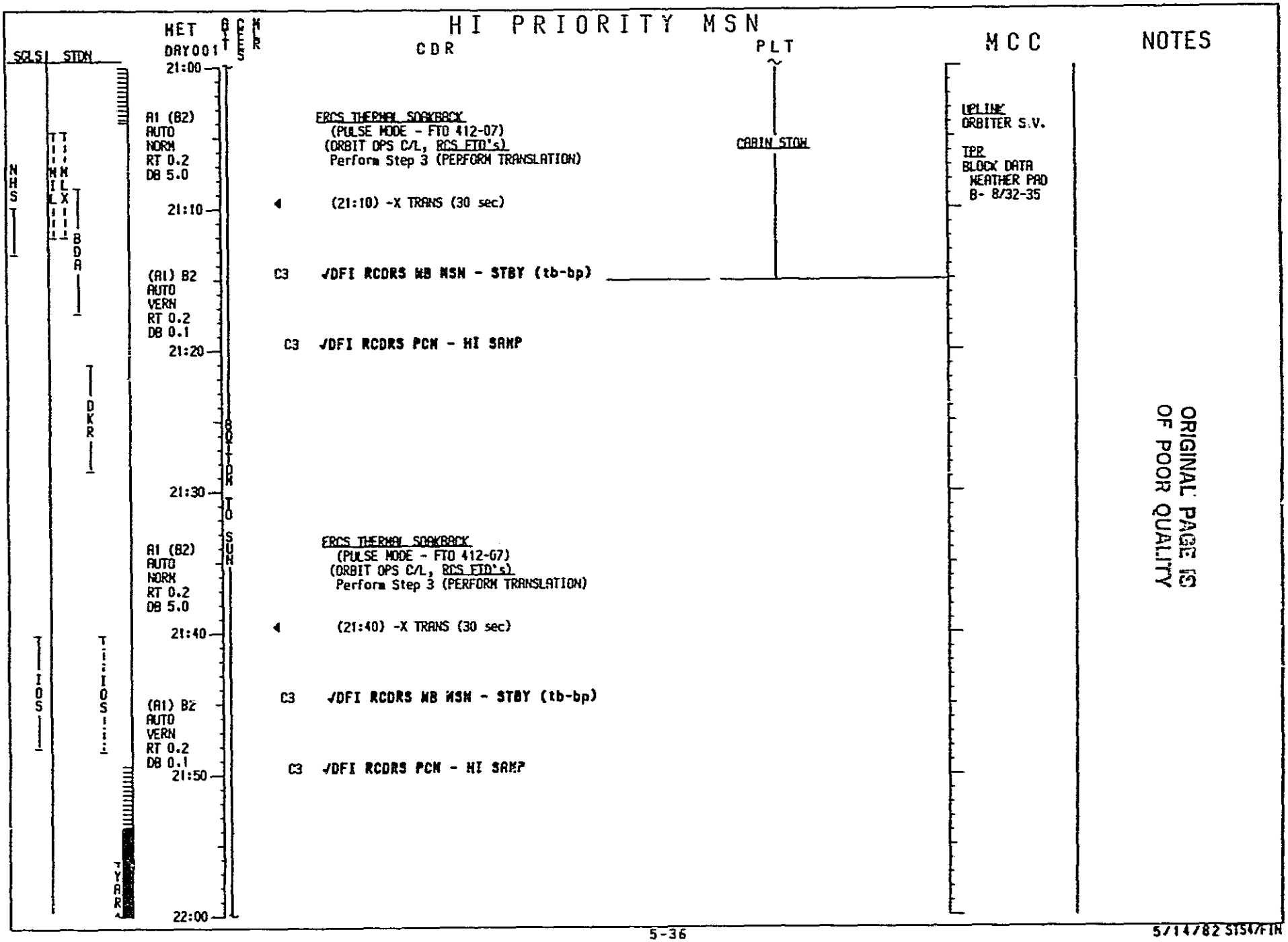
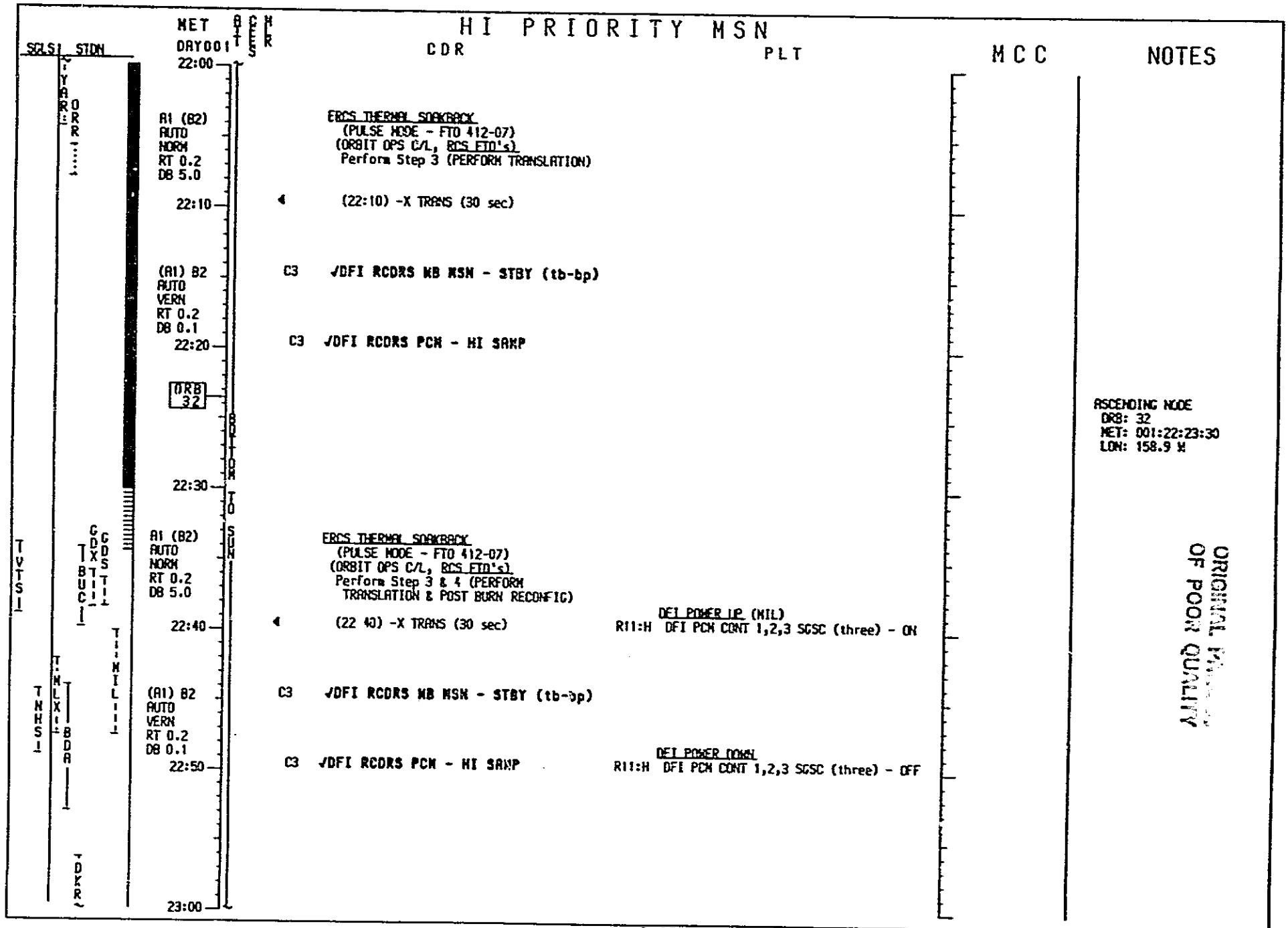
5/14/82 SYS47FIN


HI PRIORITY MSN
MET
DAY001
SGLS
STDN
BCMC
TAPES
CDR
PLT
MCC
NOTES
20:00
20:10
20:20
20:30
20:40
20:50
21:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
MEAL
MEAL
A1 (B2)
AUTO
NORM
RT 0.2
DB 5.0
ERCS THERMAL SOAKBACK
(PULSE MODE - FTO 412-07)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 2 & 3 (PERFORM
PRE BURN CONFIG & TRANSLATION)
(20:40) -X TRANS (30 sec)
HOUSEKEEPING
C3 /DFI RCDRS WB MSN - STBY (tb-bp)
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
C3 /DFI RCDRS PCM - HI SAMP
ORB 31
ORIGINAL PAGE IS
OF POOR QUALITY
ASCENDING NODE
ORB: 31
MET: 001:20:53:02
LON: 135.7 W
5/14/82 SYS4/FIN



5/14/82 STS4/FIN

HI PRIORITY MSN



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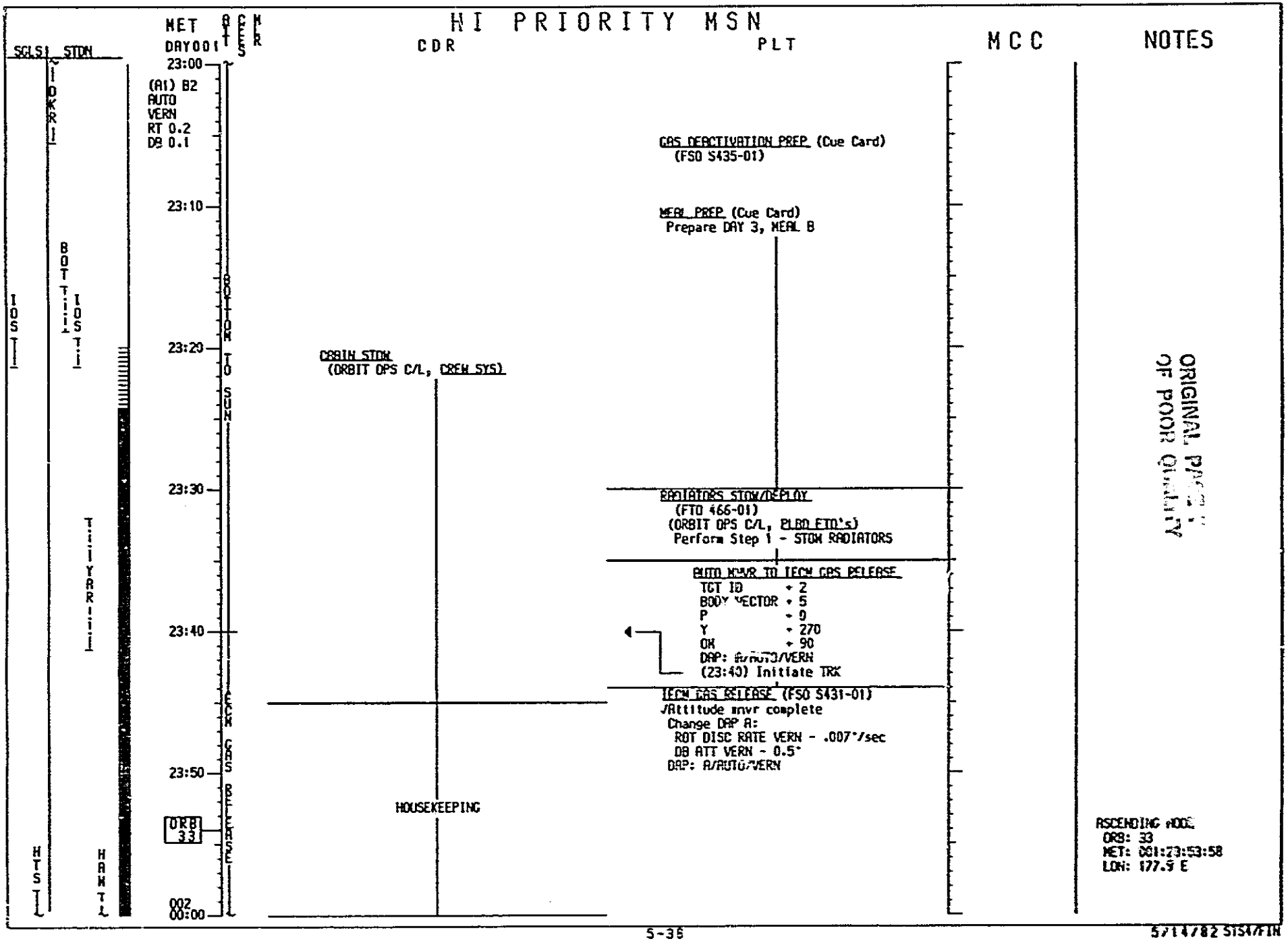
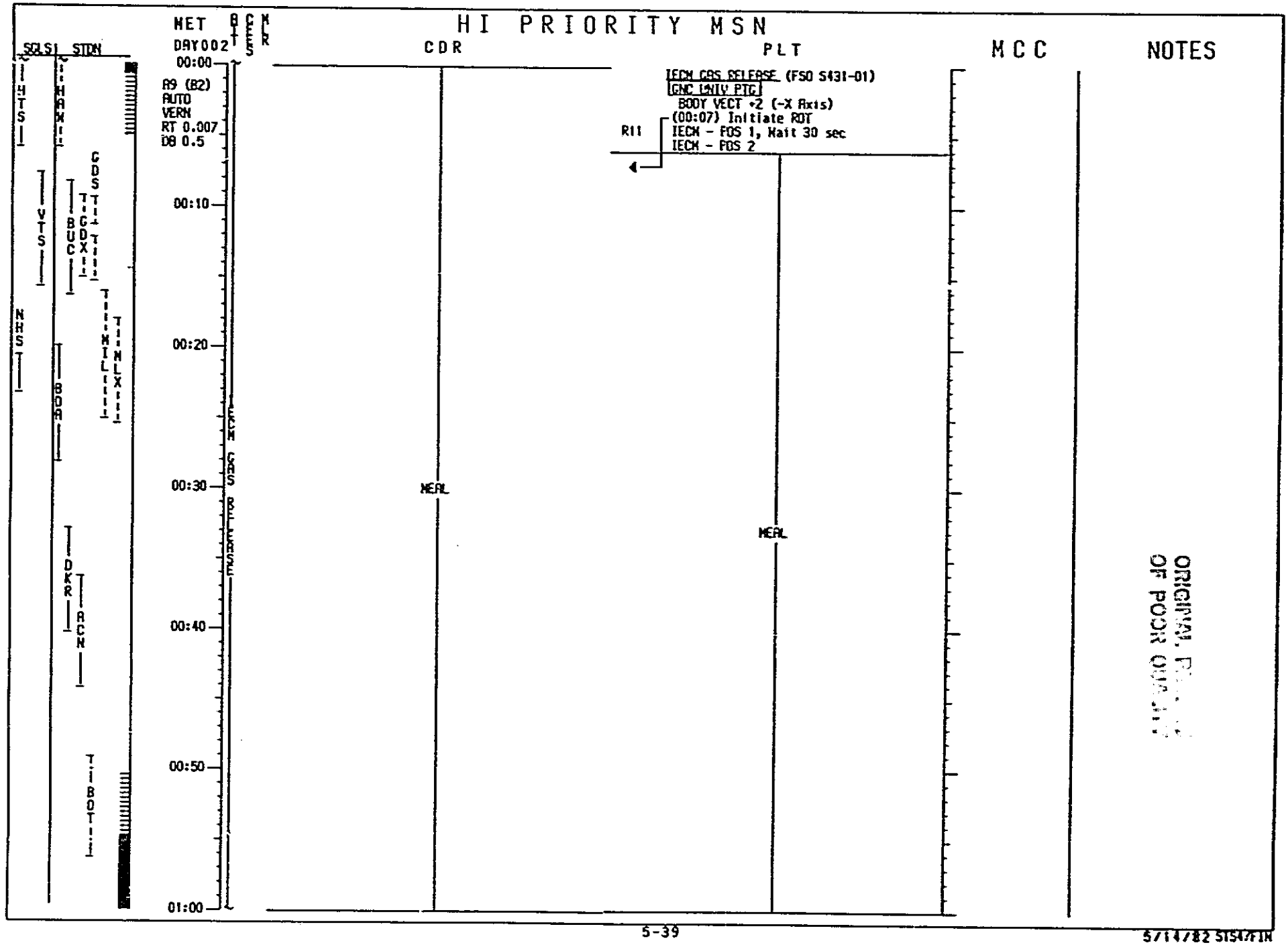
5/14/82 STS4/FIN



5/14/82 STS4/FIN


HI PRIORITY MSN
MET
DAY002
SELS
STDN
CDR
PLT
MCC
NOTES
00:00
00:10
00:20
00:30
00:40
00:50
01:00
A9 (B2)
AUTO
VERN
RT 0.007
DB 0.5
IECM GDS RELEASE (FSO S431-01)
GNC LNLV PTG
BODY VECT +Z (-X Axis)
(00:07) Initiate RDT
R11
IECM - POS 1, Wait 30 sec
IECM - POS 2
MEAL
MEAL
HTS
VTS
NHS
BDA
BUC
DKR
ACN
GDS
TGDX
TMIL
TNLX
TBOT
IECM GDS RELEASE
ORIGINAL PAGE
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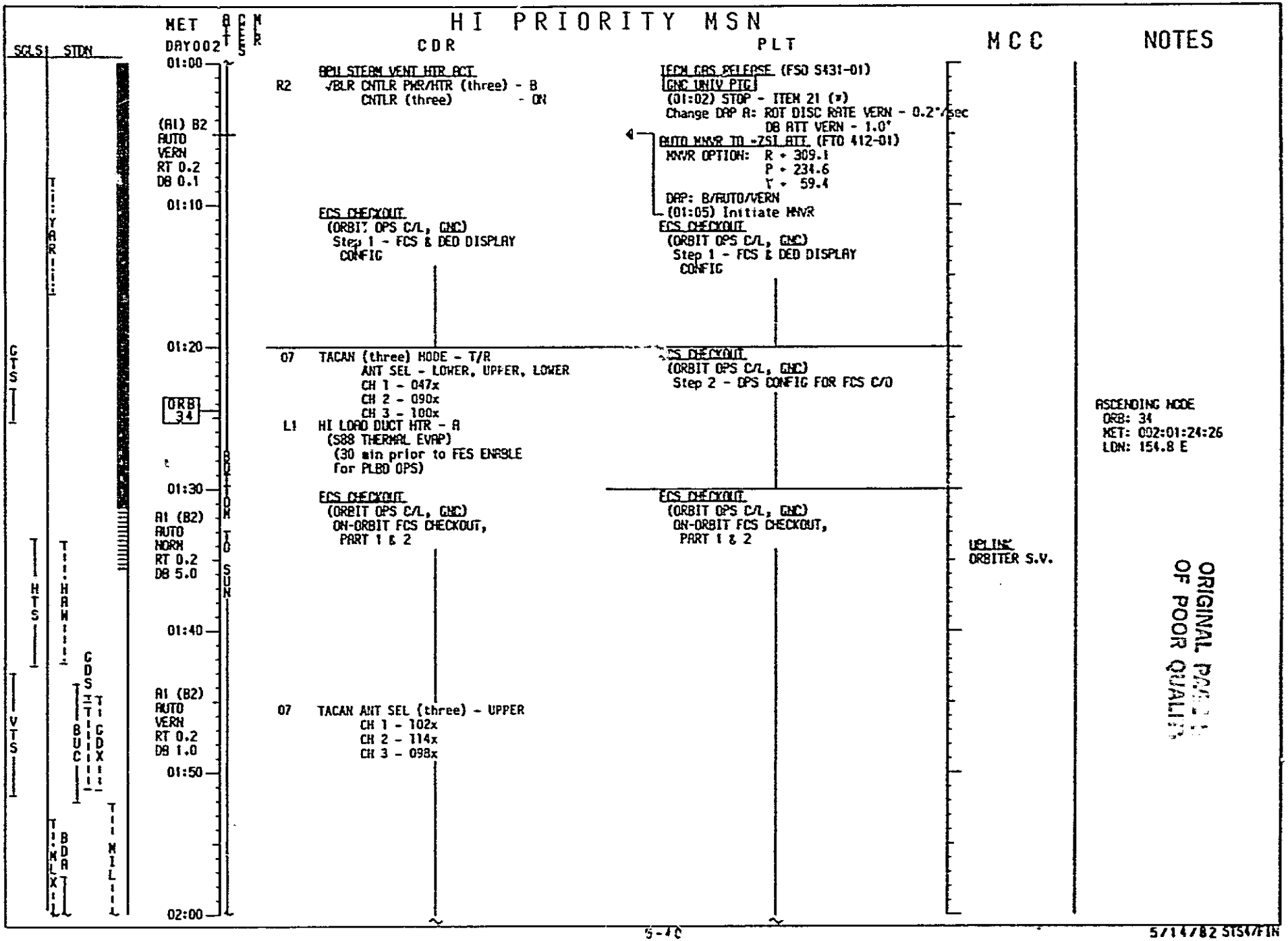
HI PRIORITY MSN



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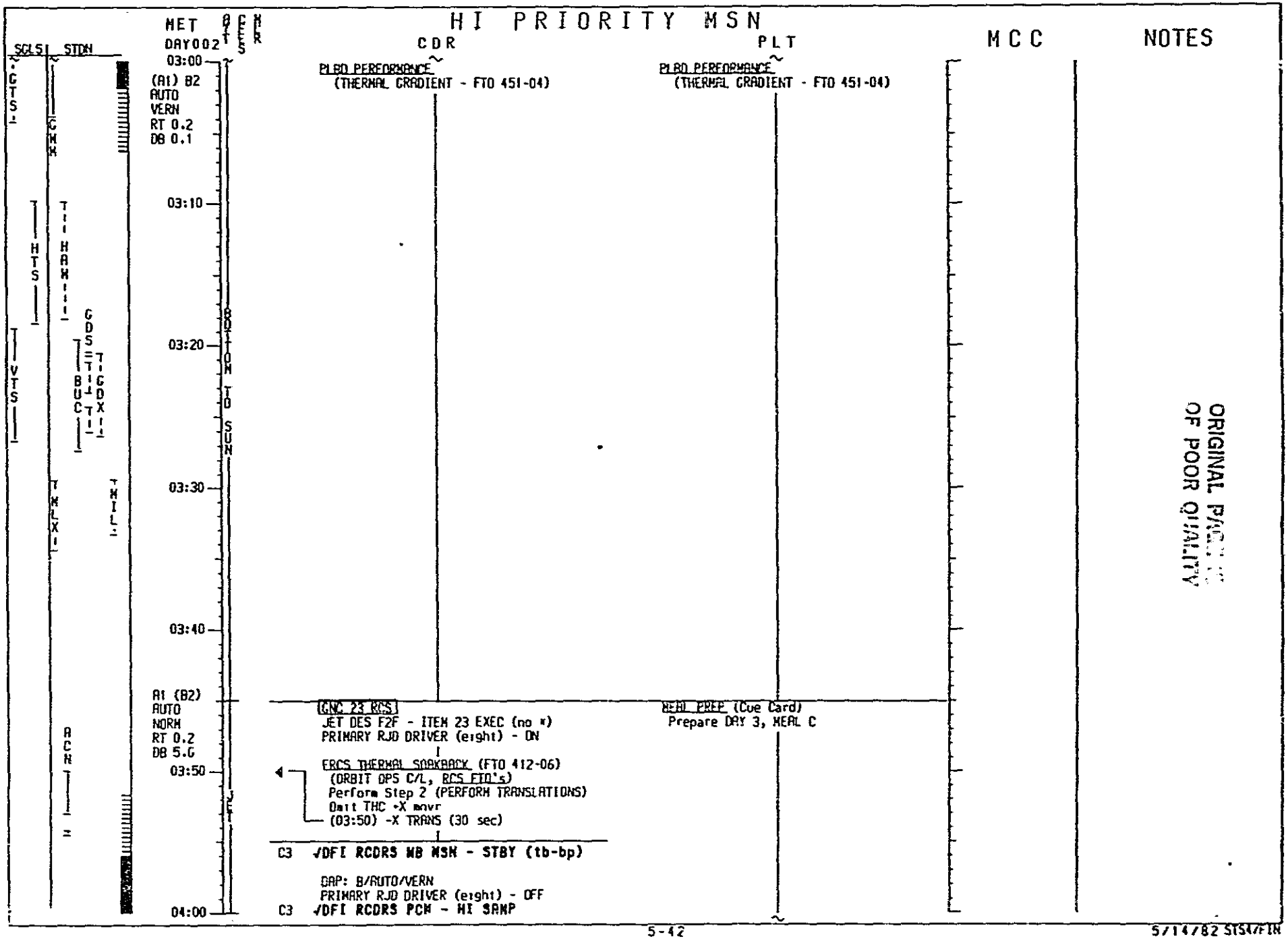
5/14/82 STS4/FIN



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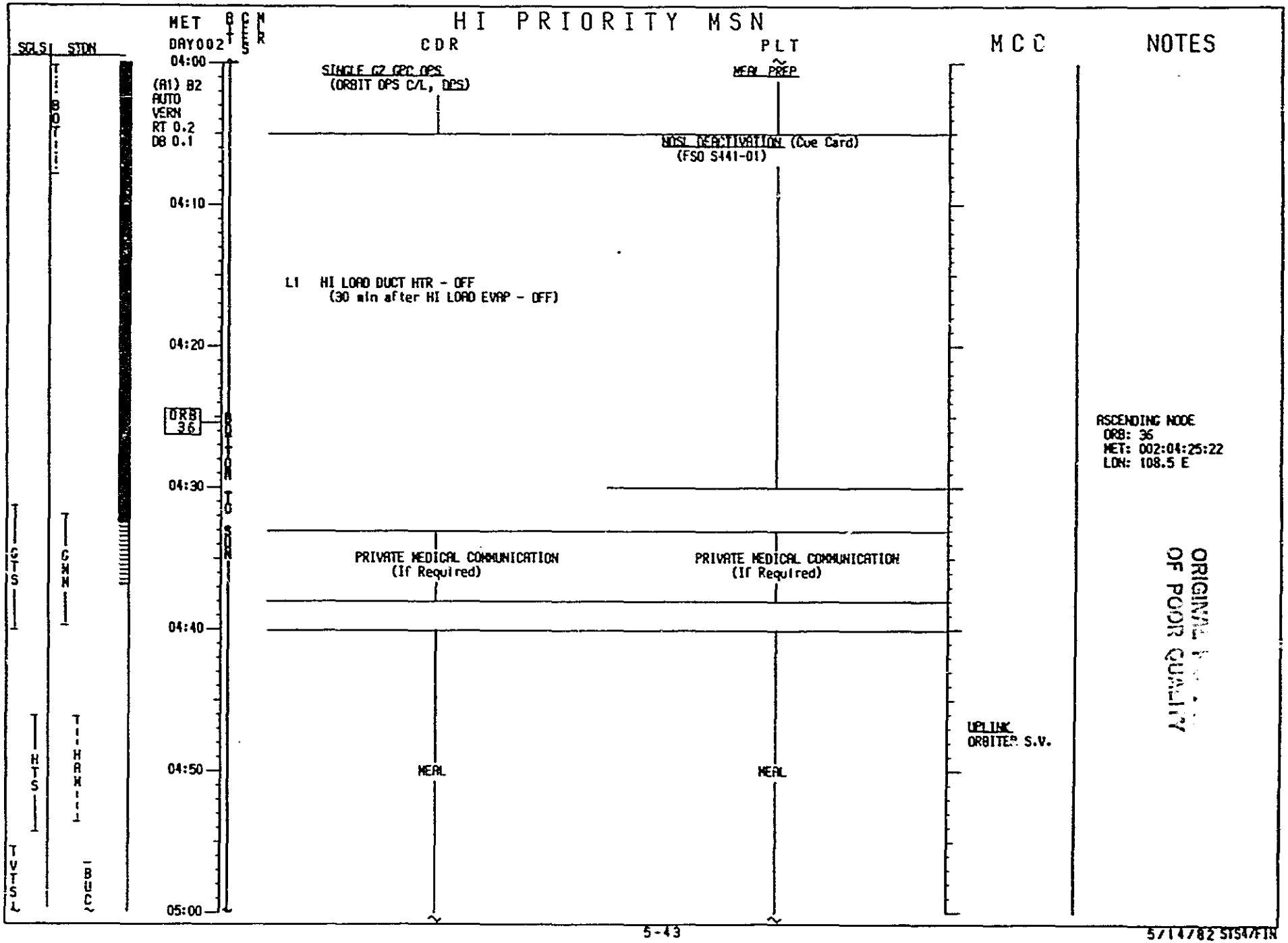
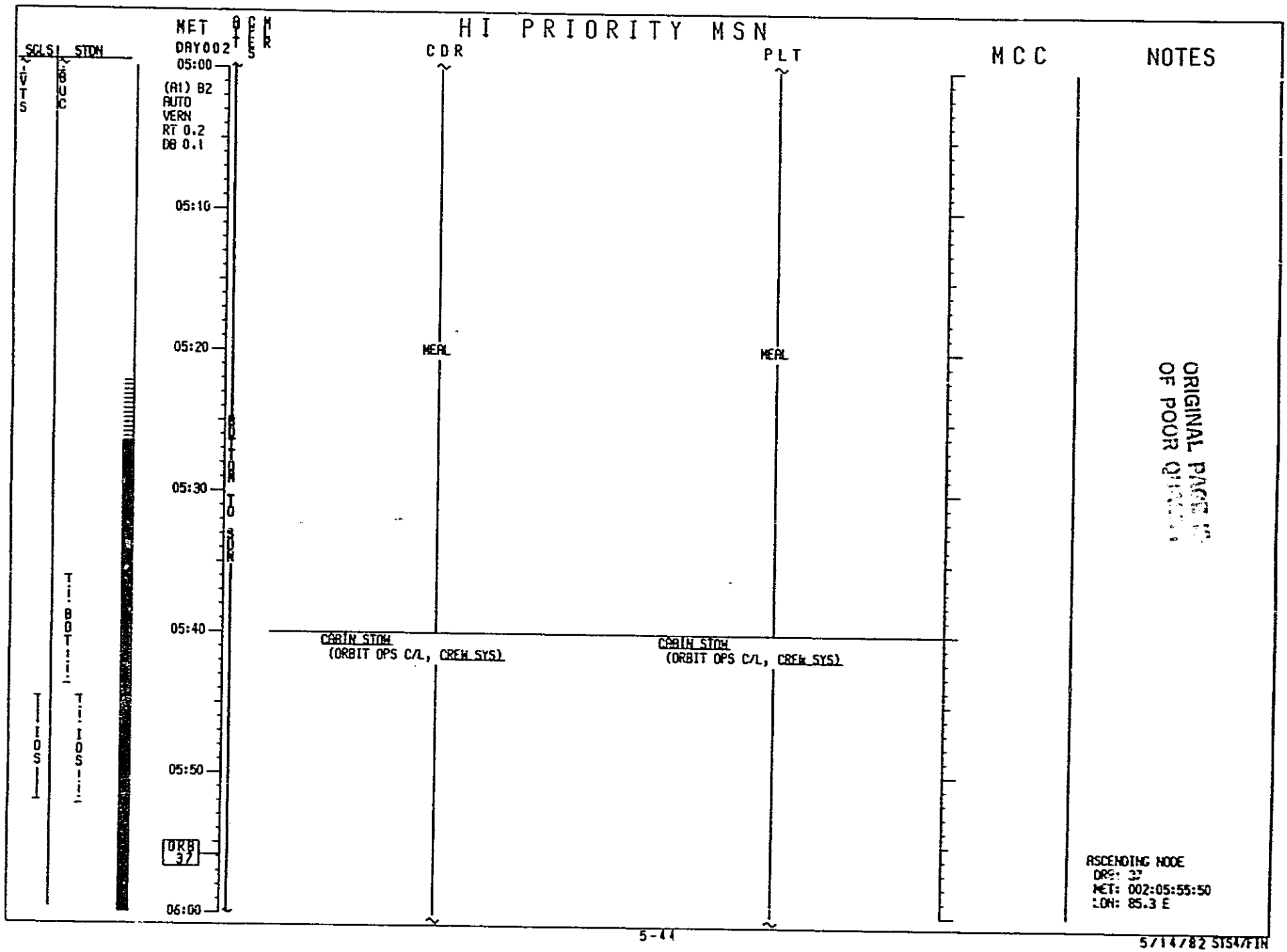

HI PRIORITY MSN
MET
DAY 002
CDR
PLT
MCC
NOTES
SGLS
STDN
BOOST
GTS
GNC
HTS
THRUST
TVTSL
BUC
04:00
04:10
04:20
04:30
04:40
04:50
05:00
ORB 36
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
SINGLE G2 GPC OPS
(ORBIT OPS C/L, OPS)
MEAL PREP
MDSI DEACTIVATION (Cue Card)
(FSO S441-01)
L1 HI LOAD DUCT HTR - OFF
(30 min after HI LOAD EVAP - OFF)
PRIVATE MEDICAL COMMUNICATION
(If Required)
PRIVATE MEDICAL COMMUNICATION
(If Required)
MEAL
MEAL
UPLINK
ORBITER S.V.
ASCENDING NODE
ORB: 36
MET: 002:04:25:22
LON: 108.5 E
ORIGINAL PAGE IS
OF POOR QUALITY



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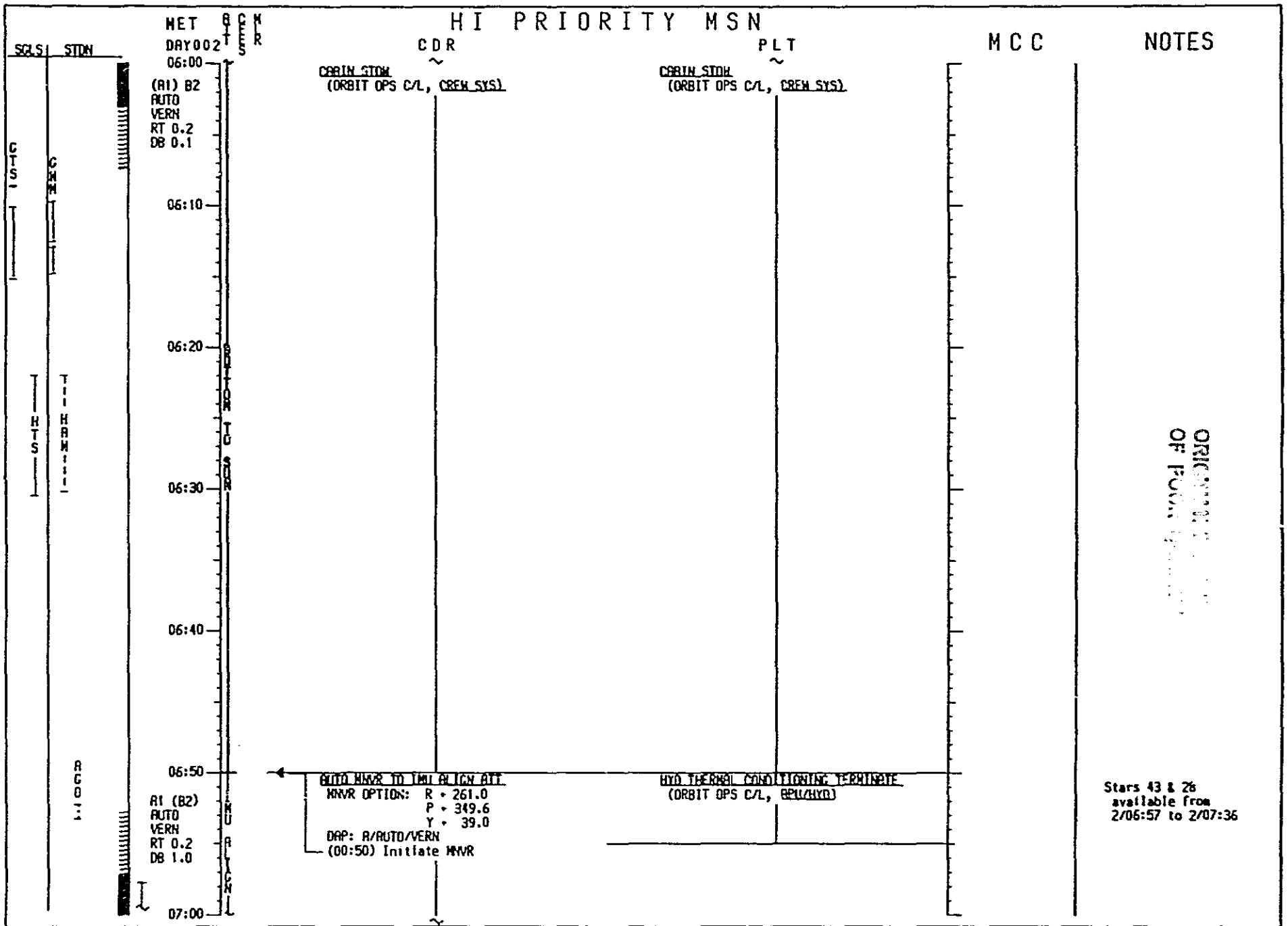
HI PRIORITY MSN
MET
DAY002
SGLS
STDN
CDR
PLT
MCC
NOTES
06:00
06:10
06:20
06:30
06:40
06:50
07:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
AUTO MNVR TO INRTL ALIGN ATT
MNVR OPTION: R = 261.0
P = 349.6
Y = 39.0
DAP: R/AUTO/VERN
(00:50) Initiate MNVR
HYD THERMAL CONDITIONING TERMINATE
(ORBIT OPS C/L, APU/HYD)
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
Stars 43 & 26
available from
2/06:57 to 2/07:36

HI PRIORITY MSN

MET DAY 002

CDR

PLT

MCC NOTES

SGLS STDN

TDRS

07:00
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0

07:10

07:20
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
ORB 38

07:30

07:40

07:50

08:00

MNVR ALIGN

PTC XPDR

TIS BOTH TIS

TGTS1

GMT-T1

HTST1

HRT12

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 43, RASALHAGUE
-Z: 28, AL NA'IR
RNG DIF: 85.0
REPORT: IMU ALIGN RESULTS
0.4 DEG/SEC PTC,XPDR - INITIATE
(FTO 412-01)
MNVR OPTION: R+ 165.8
P+ 232.6
Y+ 58.3
DAP: A/AUTO/VERN
(07:10) Initiate MNVR

When MNVR to PTC ATT complete,
CHANGE DAP A:
ROT DISC RATE VERN - 0.4 °/SEC
CHANGE DAP B:
DB ATT VERN - 1.0°
BODY VECT +4
(07:30) Initiate ROT

ERCS/RCS THERMAL SOAKBACK (FTO 412-06)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 3 (RECONFIG TO NOMINAL)

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____
FUEL CELL PURGE - AUTO (Cue Card)

CABIN TV STOW
KF57E/ Stow both cameras
KF57C

PAYLOAD DEACTIVATION
(OPERATIONS C/L, TAB E)

GAS DEACTIVATION (Cue Card)
(FSO S135-01)

STOW GAS ENCODER (Cue Card)

POST OPERATIONS DOCUMENTATION
(OPERATIONS C/L, TAB P70/14 & P70/15)

PAYLOAD DEORBIT PREPARATION
(OPERATIONS C/L, TAB F)

IMU ALIGN PAD

TRK ID ____, ____ RNG ERR ___.___
RNG 1 2 3

ΔX
( )___.___ ( )___.___ ( )___.___

ΔY
( )___.___ ( )___.___ ( )___.___

ΔZ
( )___.___ ( )___.___ ( )___.___

EXECUTION TIME: ___ / ___:___:___

RPT: IMU ALIGN RESULTS

UPDATE
H2O SPLY DUMP
QTY TK A & B

ASCENDING NODE
ORB: 38
MET: 002:07:26:18
LON: 62.2 E

MCC ONLY
COORD CDH/FDA
LIMITS CLEANUP
FOR CREW
SLEEP

UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG

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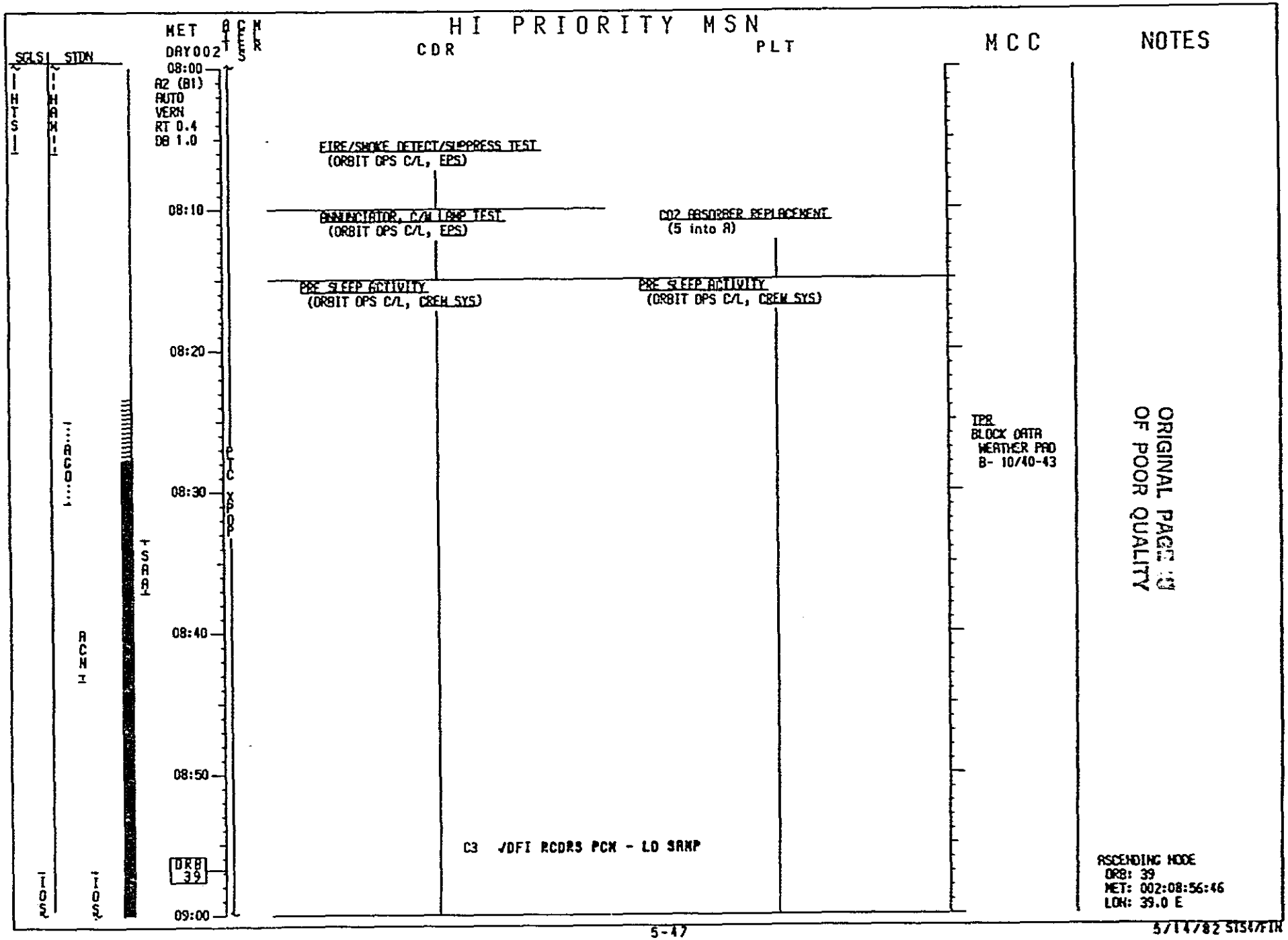
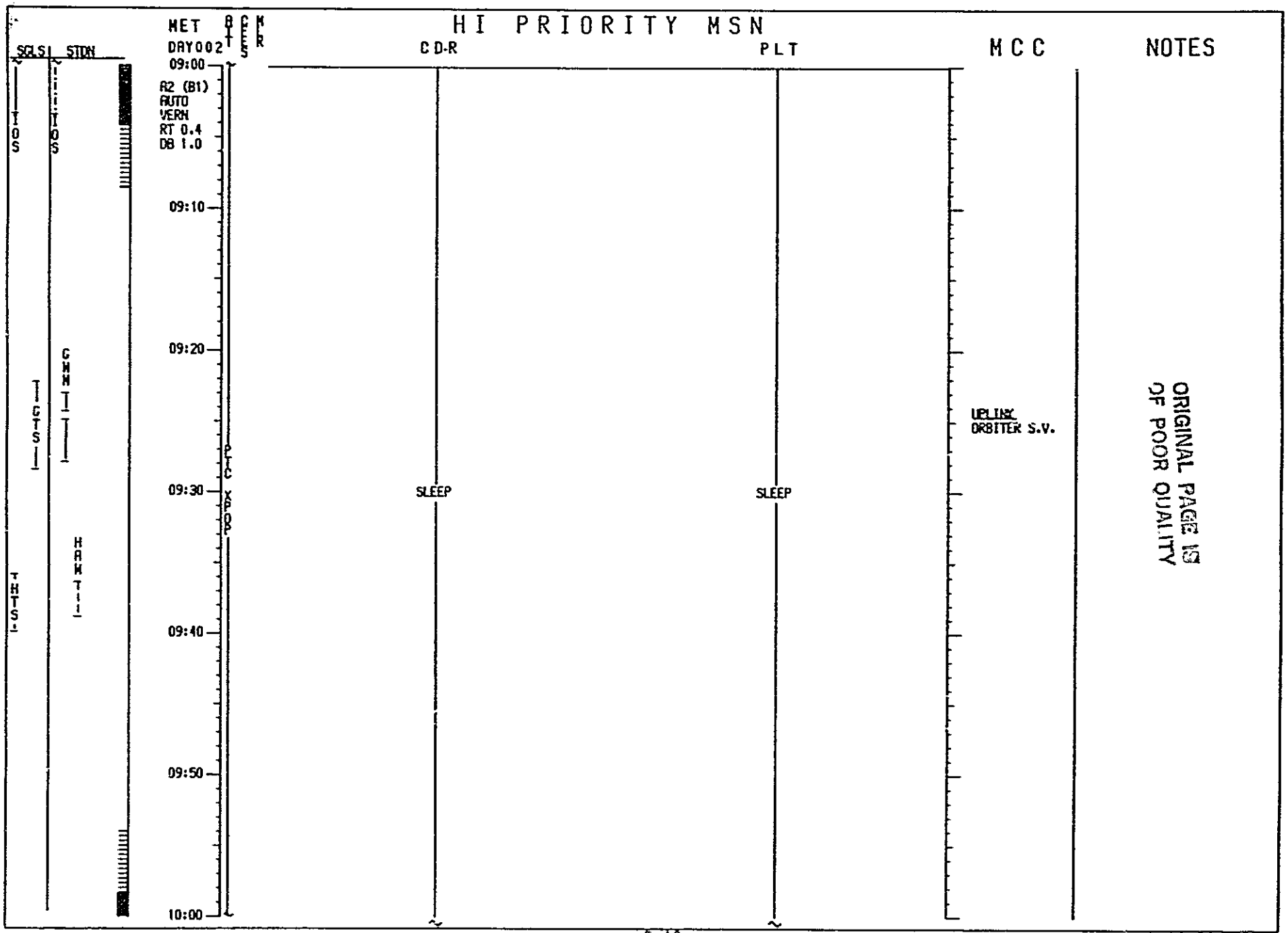
5/14/82 STS1/FIN


HI PRIORITY MSN
MET
DAY002
CDR
PLT
MCC
NOTES
SGLS
STDN
HTS
HAM
AGO
ACN
TDRS
TSAR
PTC
XPOP
08:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
08:10
08:20
08:30
08:40
08:50
09:00
FIRE/SMOKE DETECT/SUPPRESS TEST
(ORBIT OPS C/L, EPS)
ANNUNCIATOR, C/W LAMP TEST
(ORBIT OPS C/L, EPS)
CO2 ABSORBER REPLACEMENT
(5 into A)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
TPR
BLOCK DATA
WEATHER PRD
B- 10/40-43
C3 /DFI RCDRS PCN - LO SRNP
ORB 39
ORIGINAL PAGE IS
OF POOR QUALITY
ASCENDING NODE
ORB: 39
MET: 002:08:56:46
LON: 39.0 E



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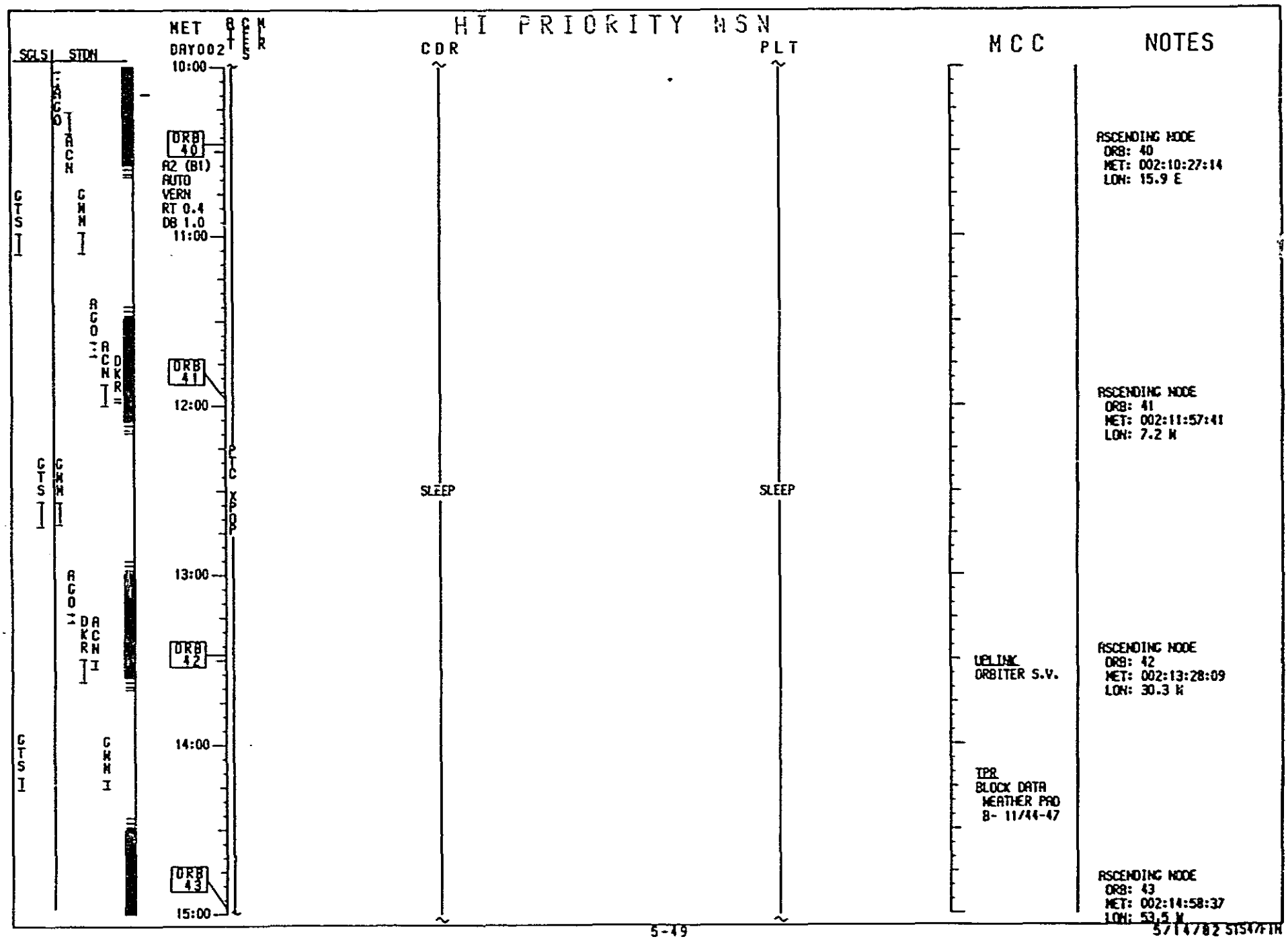
5/14/82 SIS4/FIR



ORIGINAL PAGE IS
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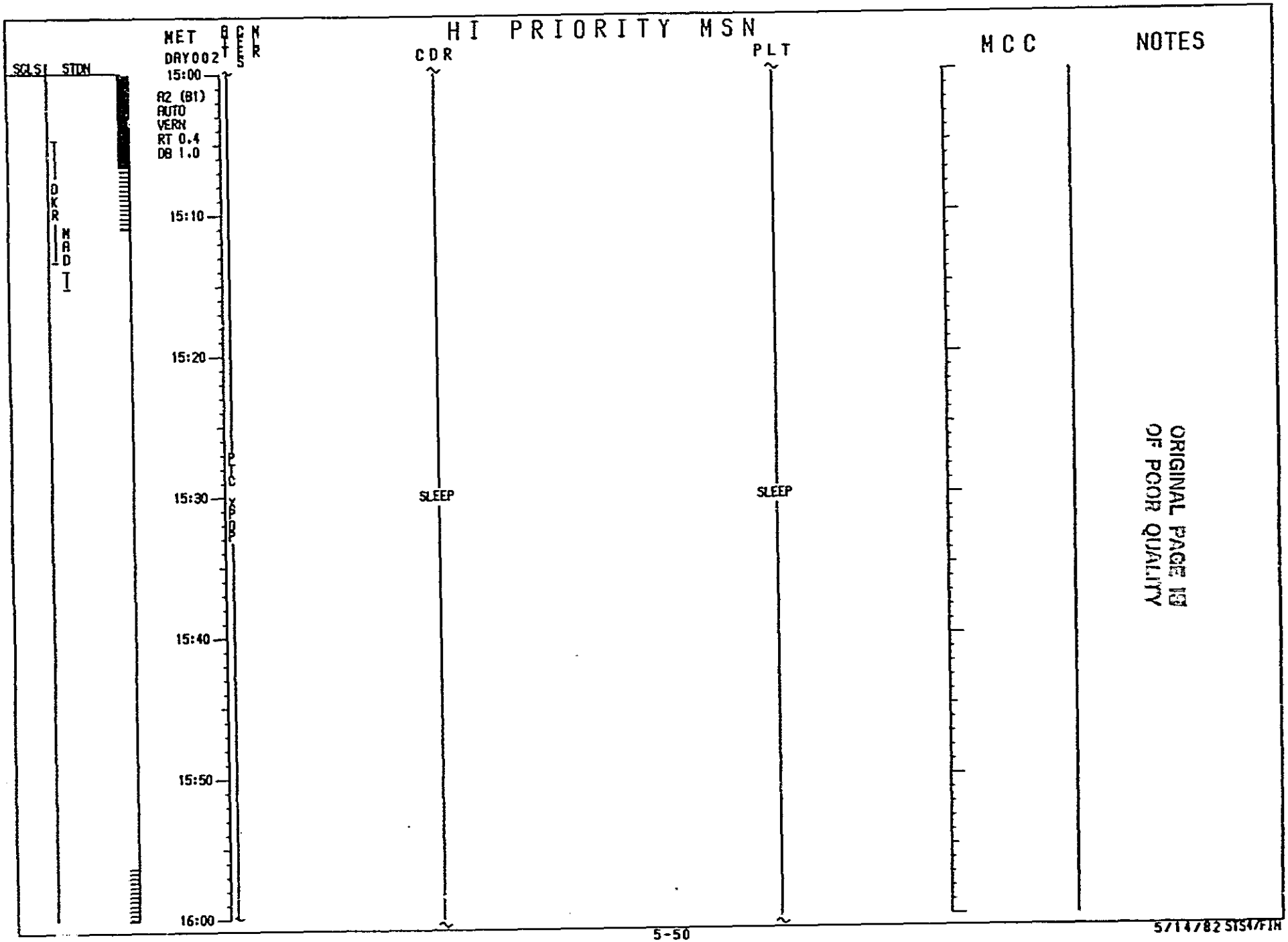
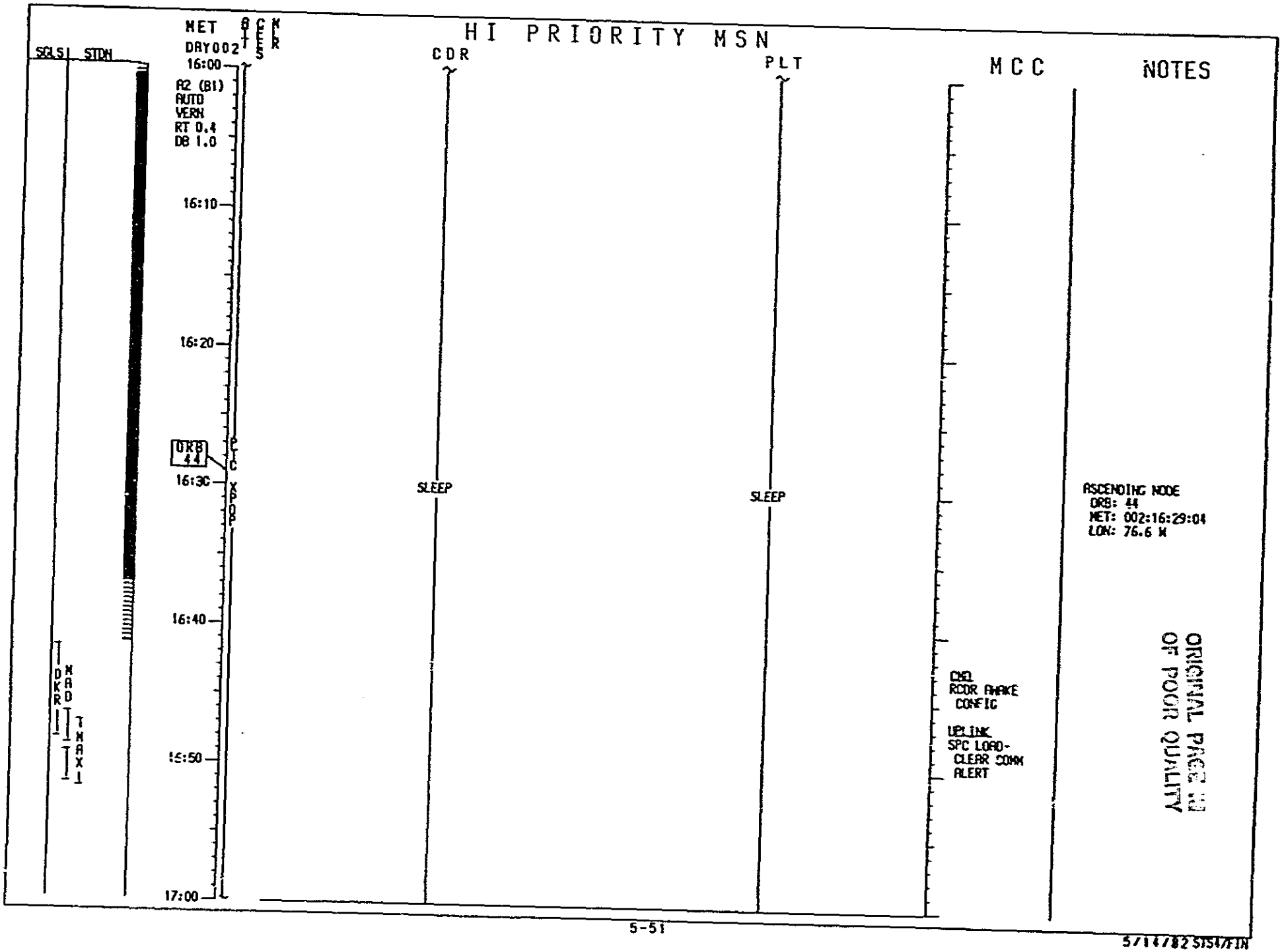

HI PRIORITY MSN
MET
DAY002
15:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
15:10
15:20
15:30
15:40
15:50
16:00
SGLS
STDN
OKR
MBD
ACES
NR
PTC
XPDR
CDR
PLT
SLEEP
SLEEP
MCC
NOTES
ORIGINAL PAGE IS
OF POOR QUALITY
5/14/82 SIS4/FIH



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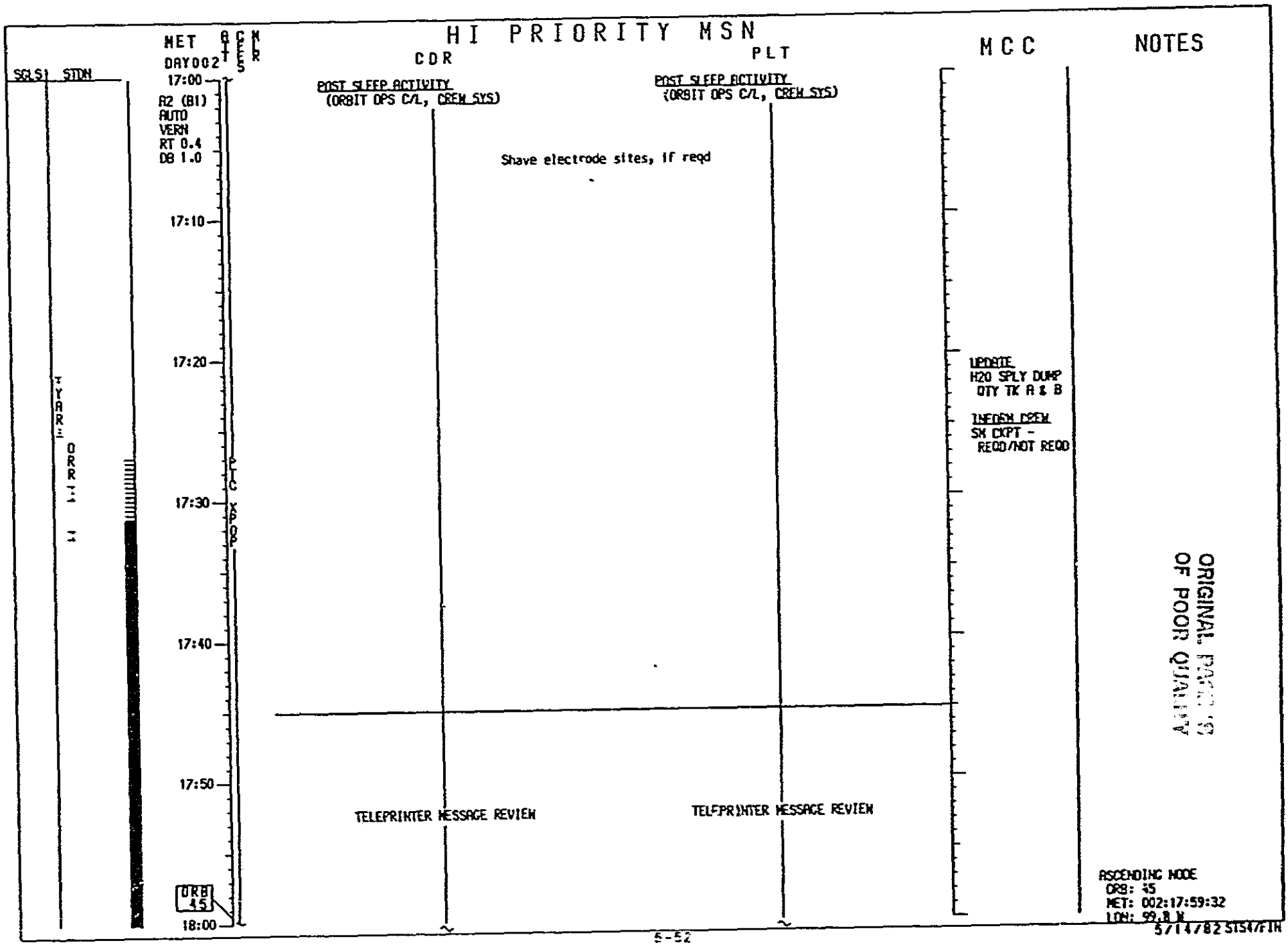
5/14/82 STS4/FIN



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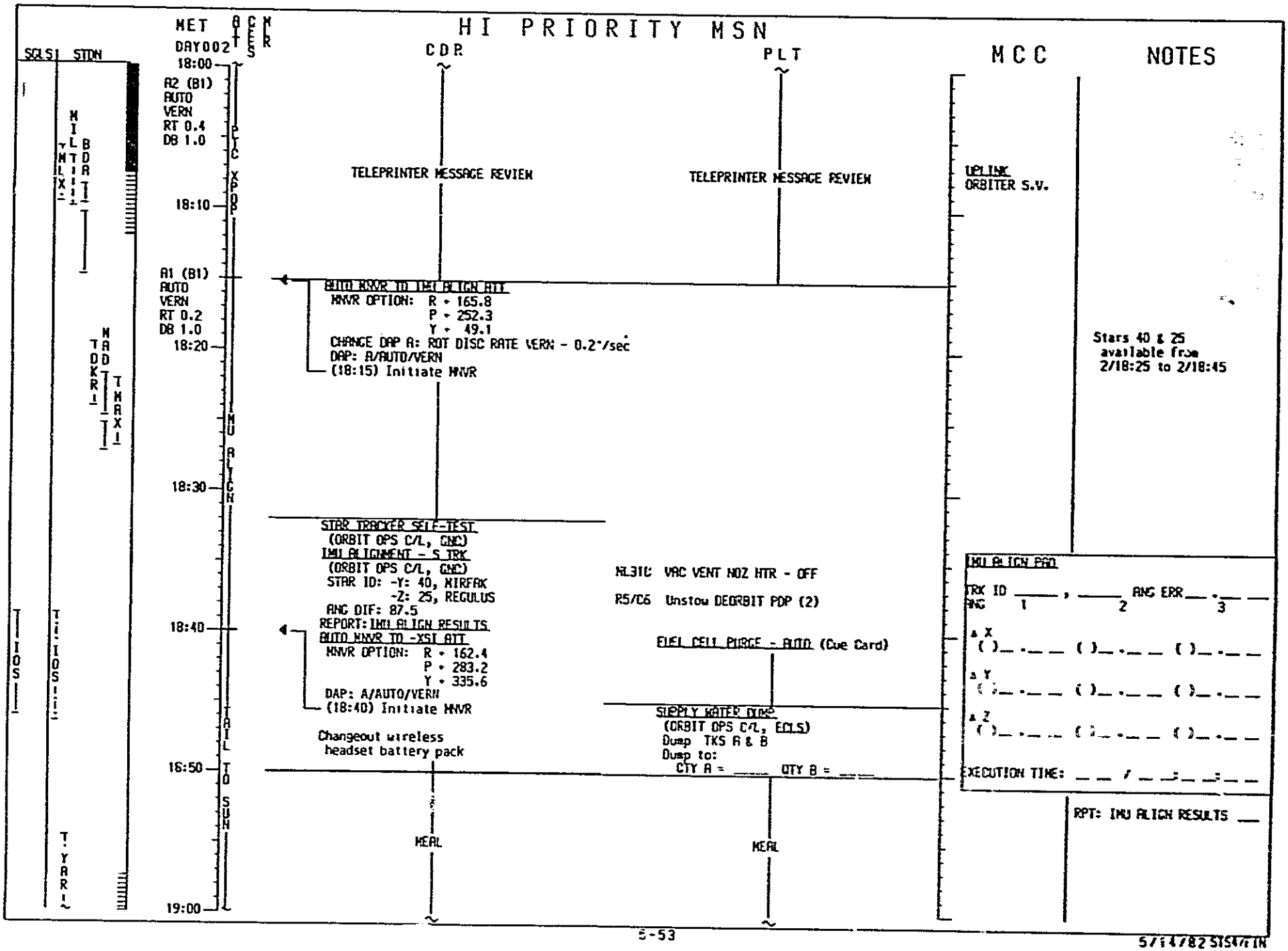
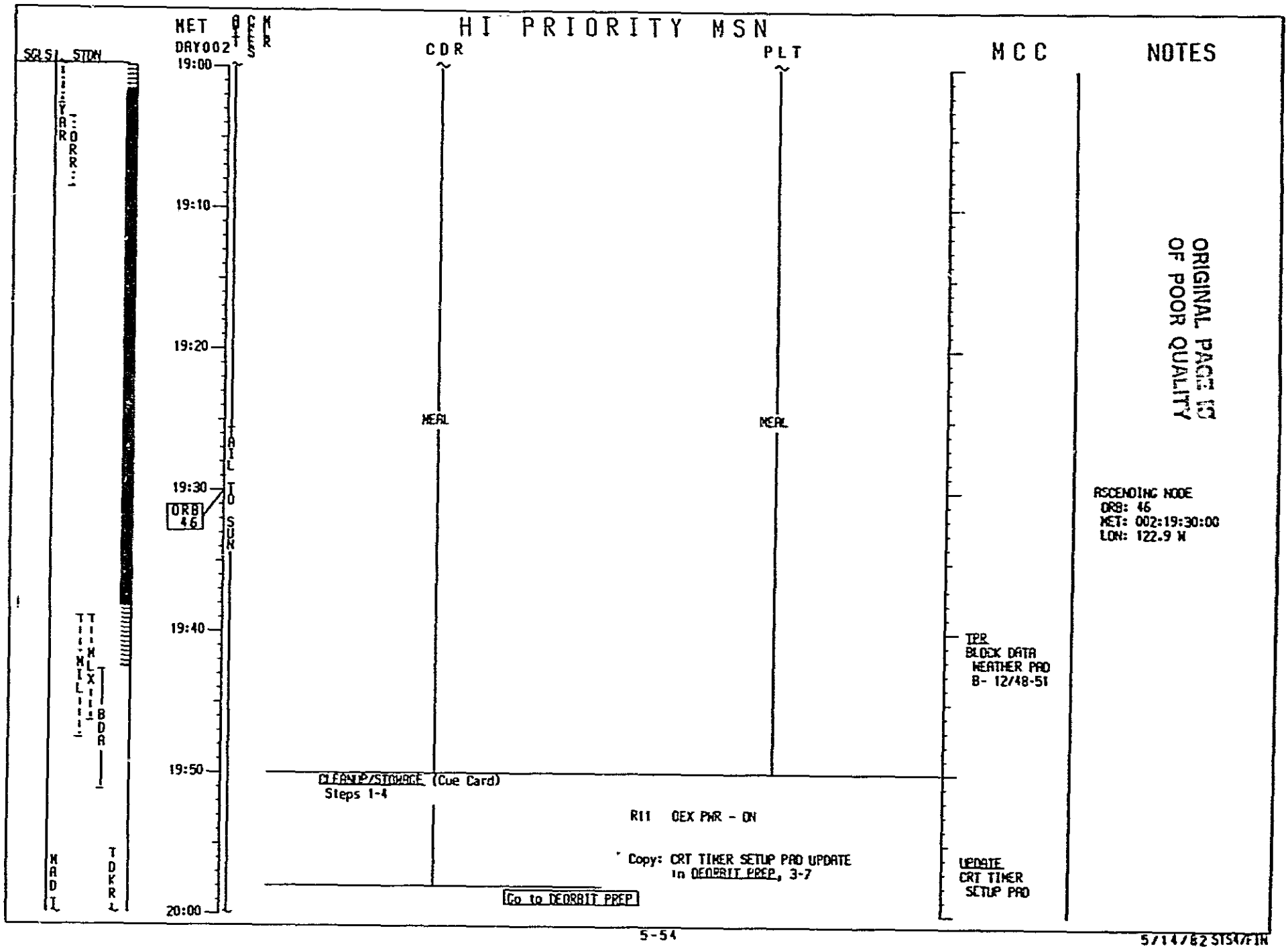

HI PRIORITY MSN
MET
DAY002
SGLS
STDN
ACMR
CDR
PLT
MCC
NOTES
18:00
18:10
18:20
18:30
18:40
18:50
19:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
TELEPRINTER MESSAGE REVIEW
TELEPRINTER MESSAGE REVIEW
UPLINK
ORBITER S.V.
Stars 40 & 25
available from
2/18:25 to 2/18:45
AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R = 165.8
P = 252.3
Y = 49.1
CHANGE DAP A: ROT DISC RATE VERN - 0.2°/sec
DAP: A/AUTO/VERN
(18:15) Initiate MNVR
STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 40, MIRFAK
-Z: 25, REGULUS
ANG DIF: 87.5
REPORT: IMU ALIGN RESULTS
AUTO MNVR TO -XSI ATT
MNVR OPTION: R = 162.4
P = 283.2
Y = 335.6
DAP: A/AUTO/VERN
(18:40) Initiate MNVR
Changeout wireless
headset battery pack
MEAL
MEAL
ML31C VAC VENT NOZ HTR - OFF
R5/C6 Unstow DEORBIT PDP (2)
FUEL CELL PURGE - AUTO (Cue Card)
SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLSS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____
IMU ALIGN PAD
TRK ID ____, ____ ANG ERR__.__
ANG 1 2 3
± X
( )__.__ ( )__.__ ( )__.__
± Y
( )__.__ ( )__.__ ( )__.__
± Z
( )__.__ ( )__.__ ( )__.__
EXECUTION TIME: __ / __:__:__
RPT: IMU ALIGN RESULTS __
MILA
MILA
TDRS
MADRID
TILA
TILA
TILA
IOS
IOS
TYARR
AOS
LOS
AOS
LOS
AOS
LOS



5/14/82 STS4/FIN

ONE-DAY EXTENSION

The STS-4 Extension Timeline is designed to follow a nominal flight up to the decision point for the 24 hour extension. This GO/NO GO decision point occurs at MET 6/00:25, prior to any deorbit-related activities for the nominal flight.

Also, this timeline may be used after the D/O PREP BACKOUT has been executed on FD 8.

24 HOUR EXTENSION CASE:

- Execute detailed timeline pages from 6/00:00 to Deorbit Prep on FD 9
- A period of time with no scheduled activities is provided immediately following the GO/NO GO to allow preparations for the extension of the flight.

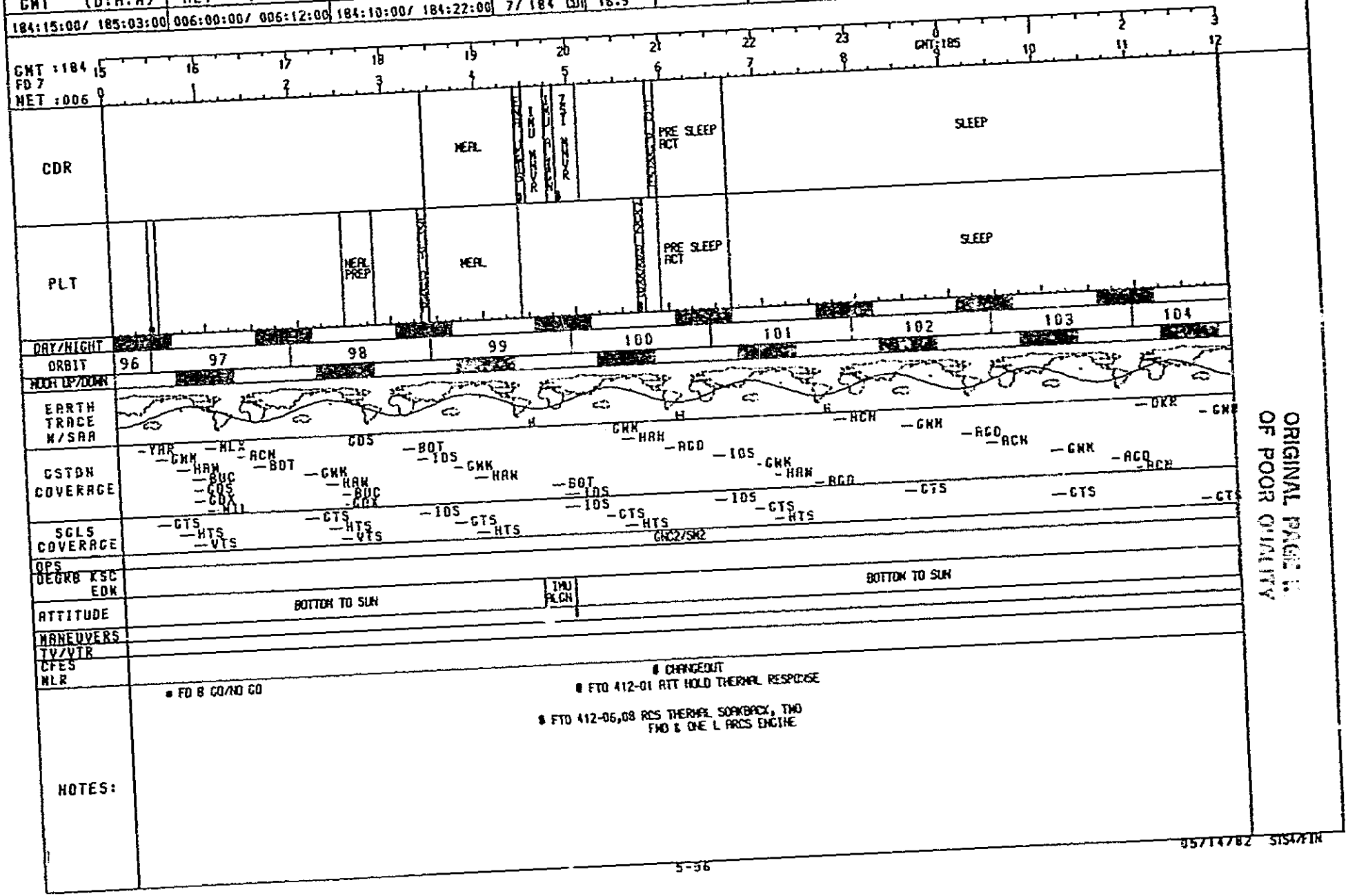
AFTER DEORBIT PREP BACKOUT CASE:

Begin timeline at 7/00:30 with the following changes:

- CDR - MCC will modify PTC to -ZLV as required (5-83); omit CABIN TV STOW at 7/04:15 MET
- PLT - Omit all activities between MET 7/02:10 and 7/04:20 (i.e., P/L DEACT, CABIN STOW, CO_2 ABSORBER REPLACEMENT)

ONE-DAY
EXTENSION

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	NOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
184:15:00/ 185:03:00	006:00:00/ 006:12:00	184:10:00/ 184:22:00	7/ 184 CDT	16.9		JULY 3, 1982	STS-4	FINAL	05/14/82



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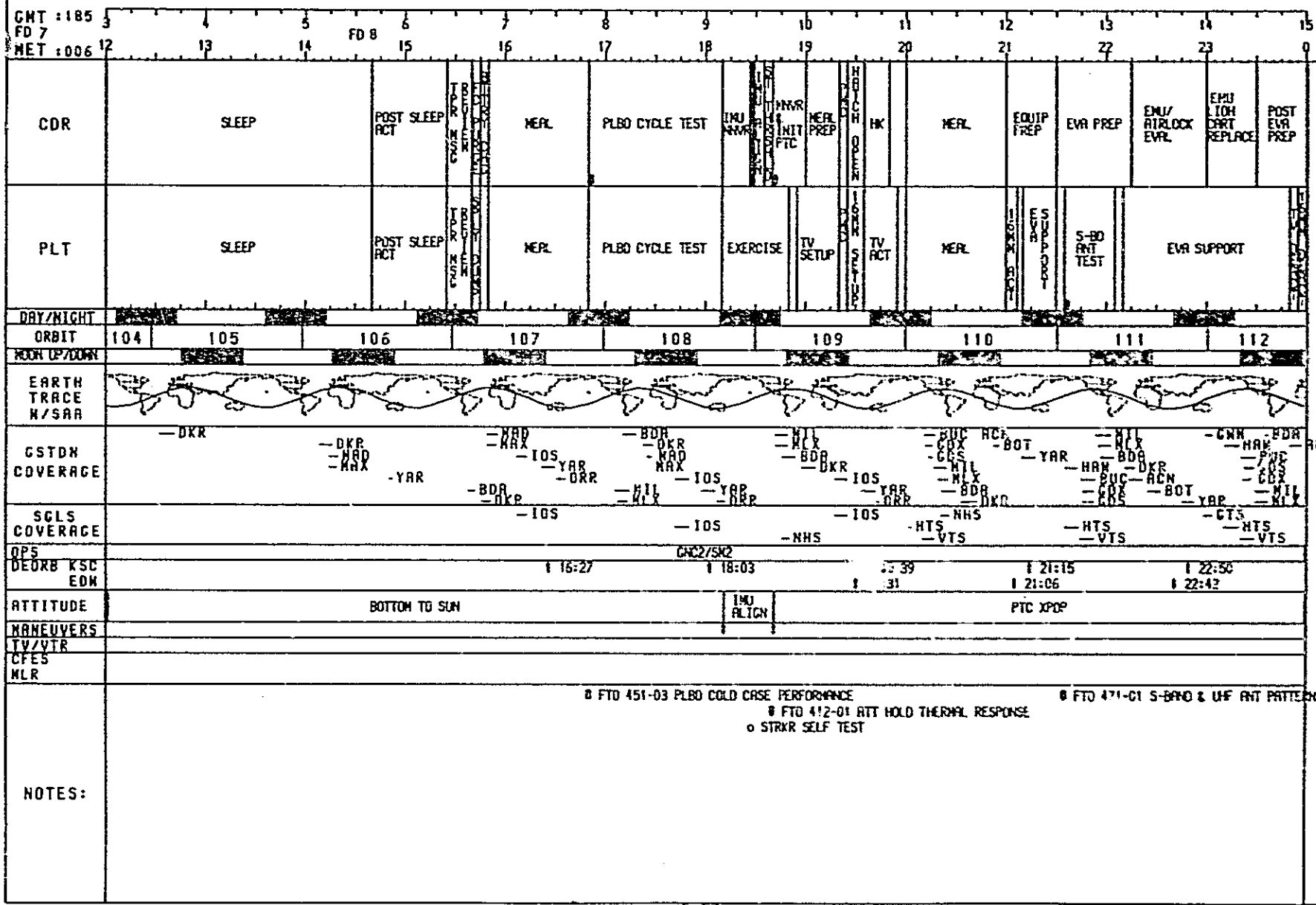
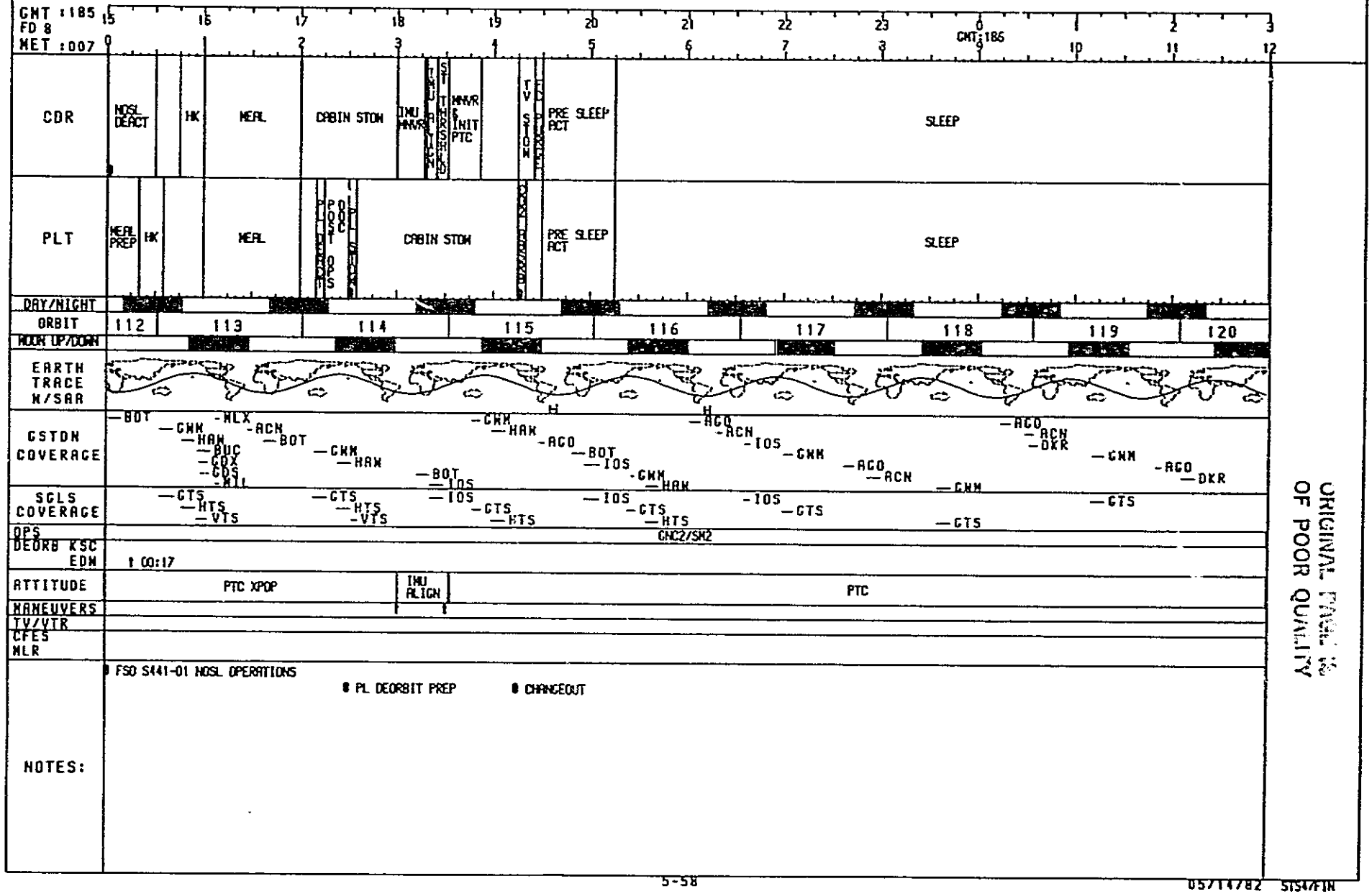
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
185:03:00/ 185:15:00	006:12:00/ 007:00:00	184:22:00/ 185:10:00	7/ 184 CDT	18.8	○	JULY 4, 1982	STS-4	FINAL	05/14/82



ORIGINAL PAGE IS OF POOR QUALITY

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
185:15:00/ 186:03:00	007:00:00/ 007:12:00	185:10:00/ 185:22:00	/ 185 CDT	20.7	○	JULY 4, 1982	STS-4	FINAL	05/14/82



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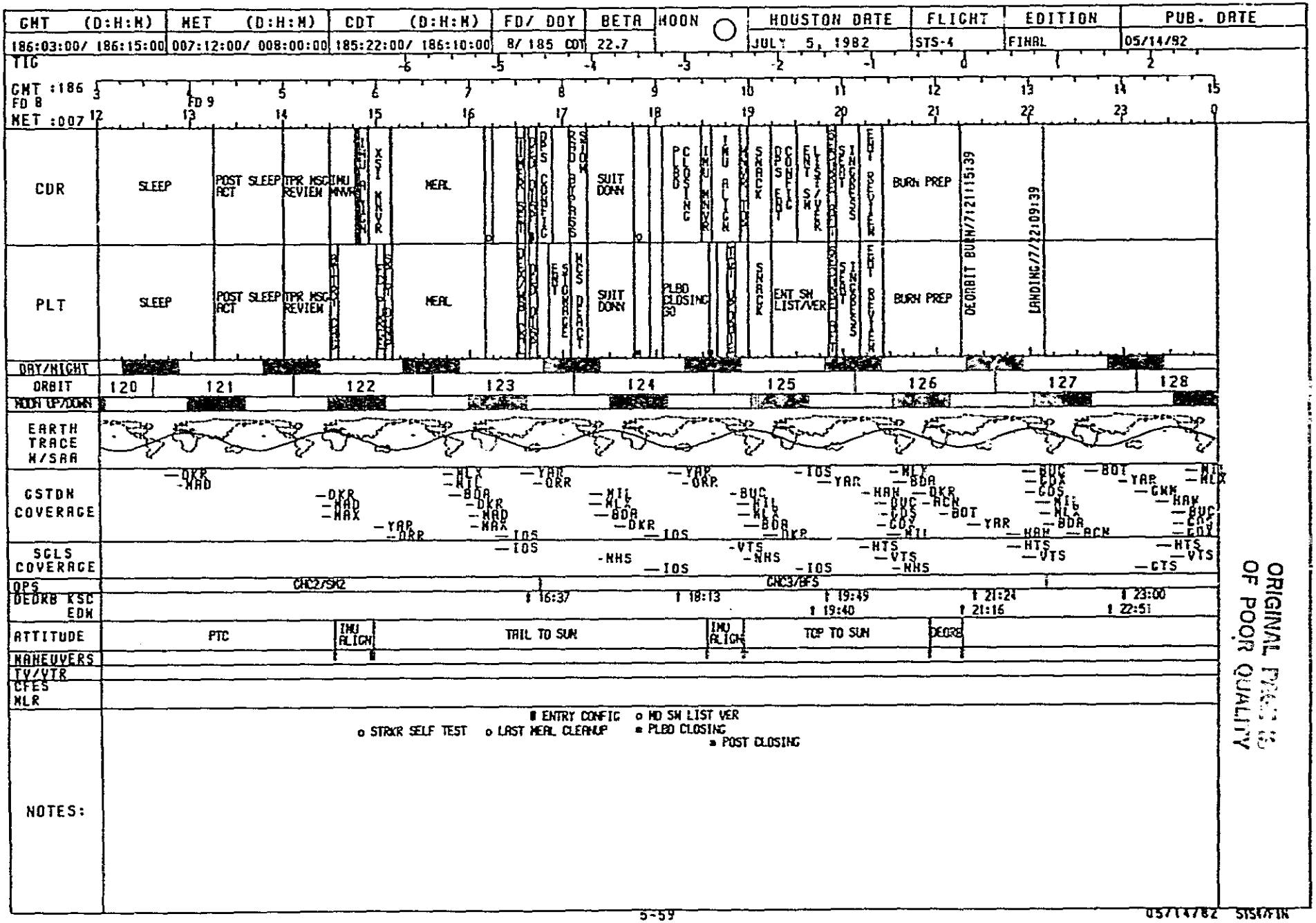

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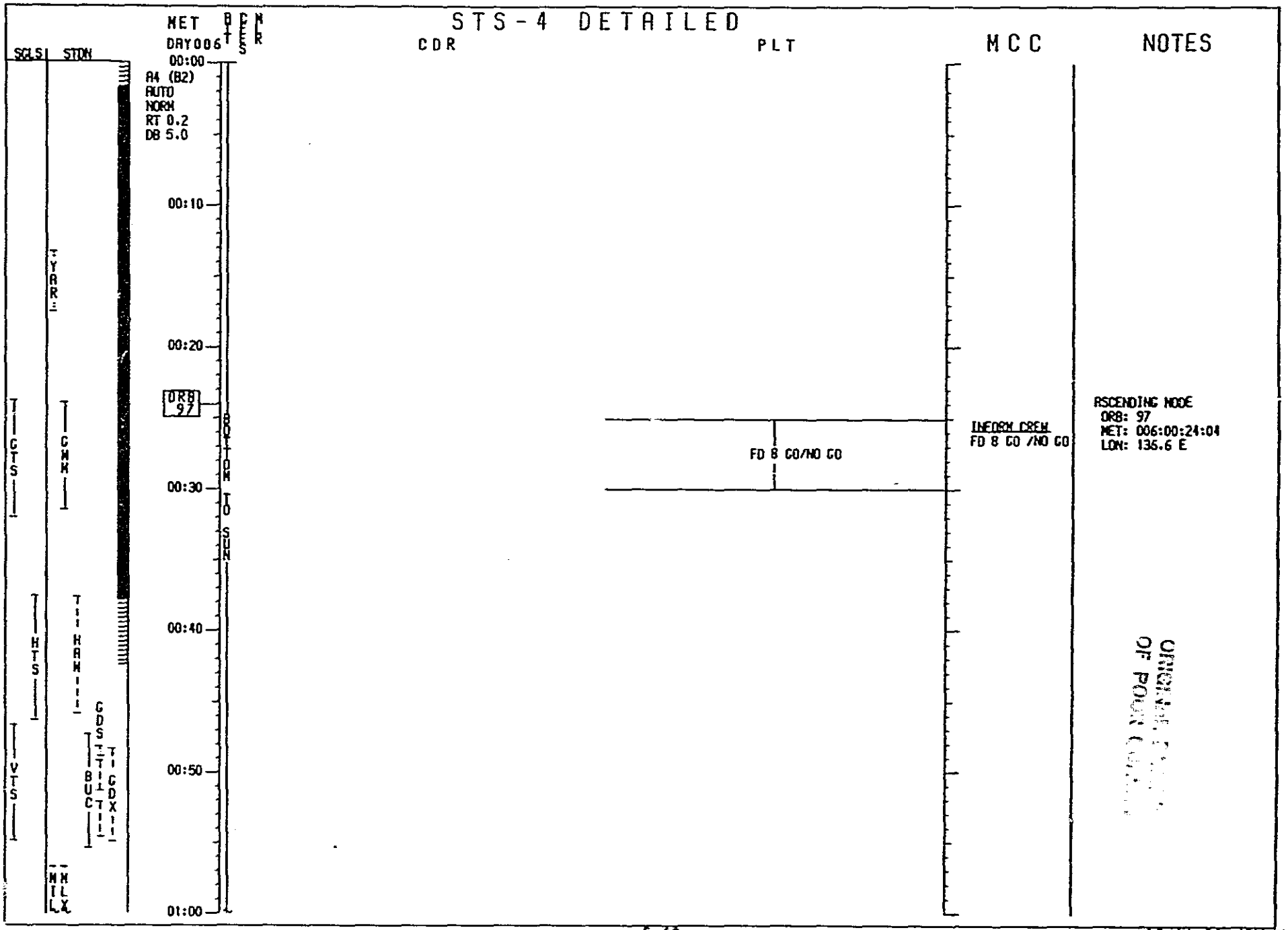
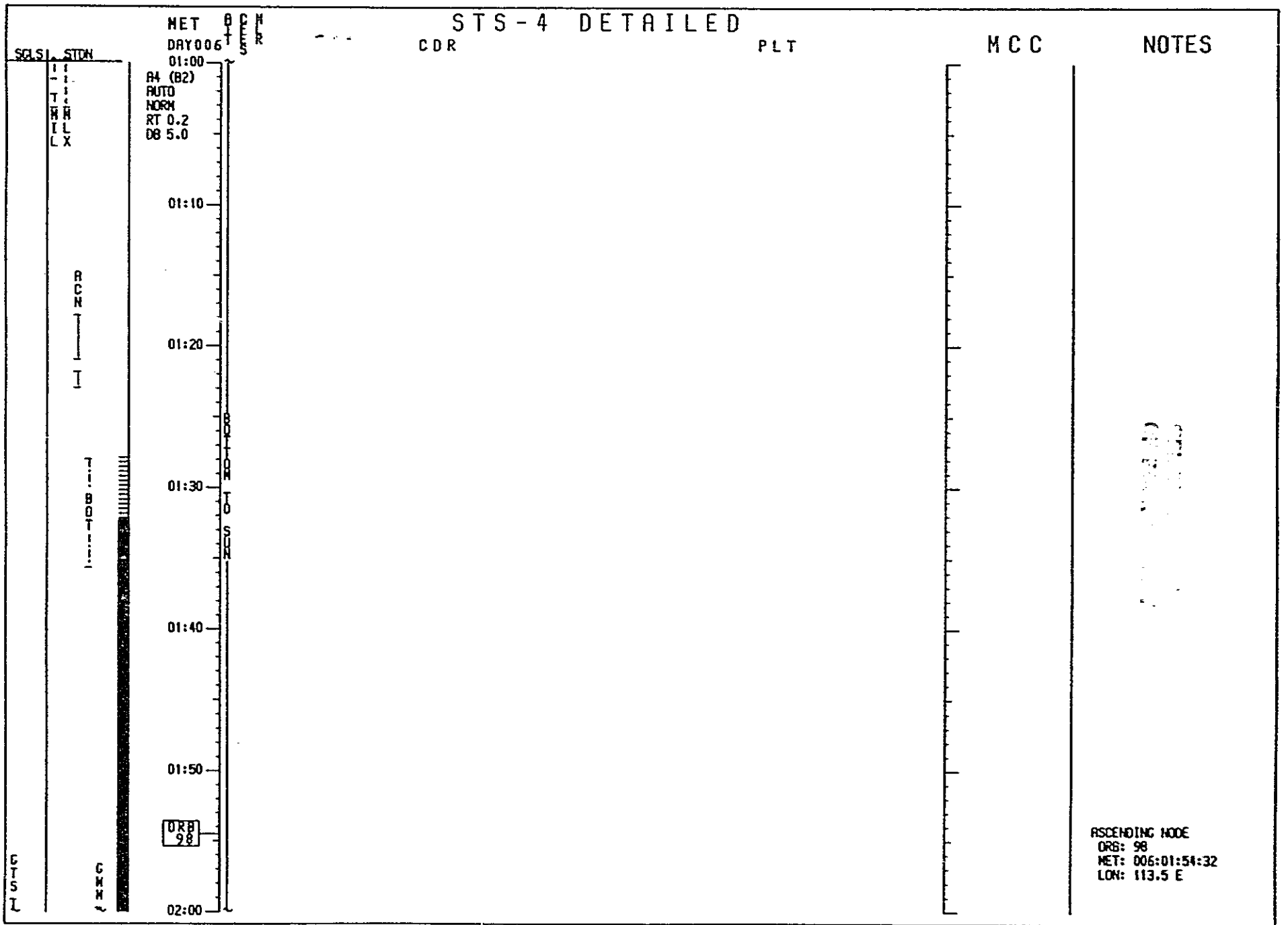
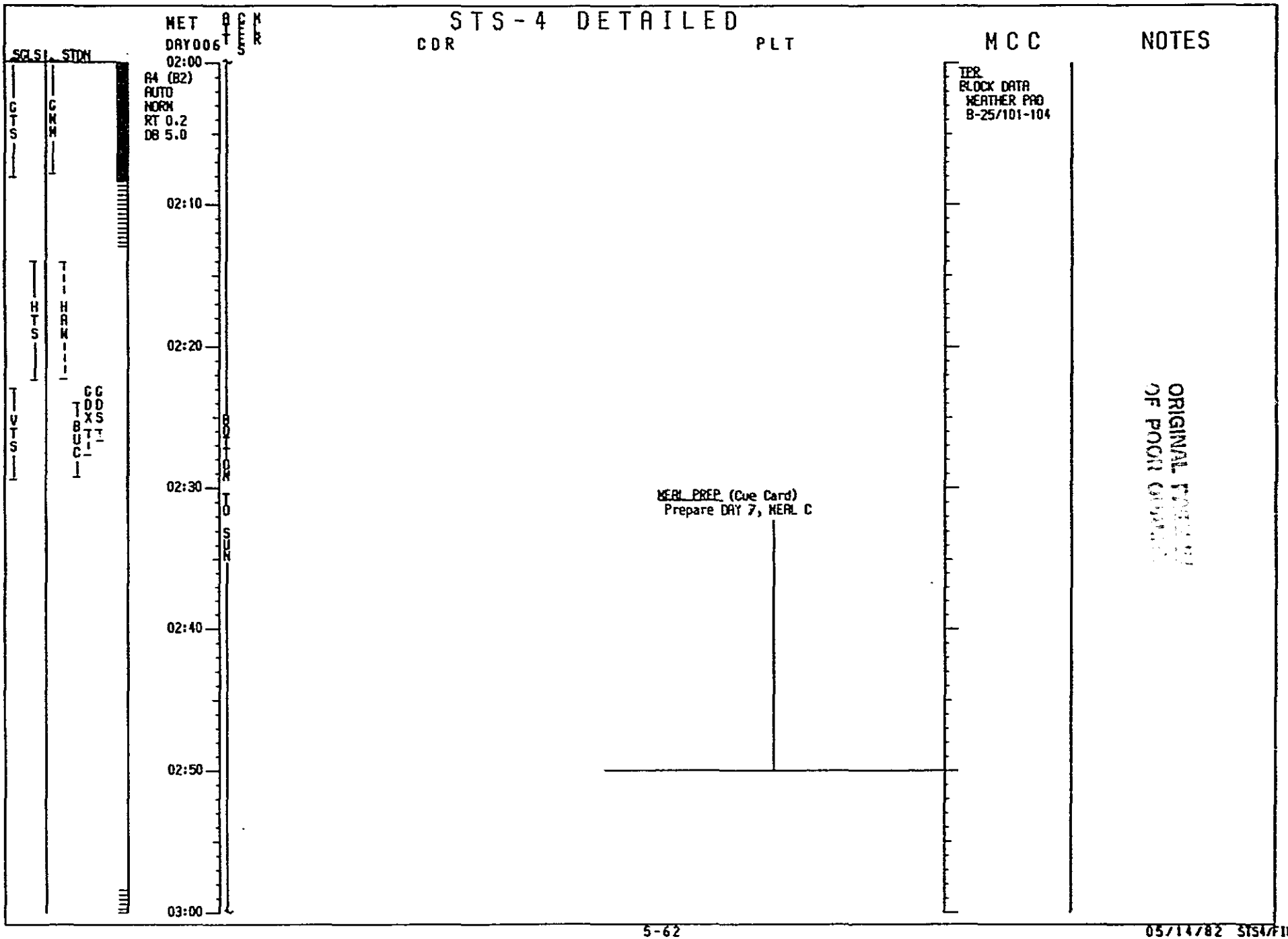

STS-4 DETAILED
MET
DAY006
CDR
PLT
MCC
NOTES
SGLS
STDN
TDRS
00:00
A4 (B2)
AUTO
NORM
RT 0.2
DB 5.0
00:10
00:20
ORB 97
00:30
00:40
00:50
01:00
TYRR
GMK
CTS
HTS
VTS
HAW
BUC
GDS
GDX
MILA
BOT ON TO SUN
FD 8 CO/NO CO
INFLIGHT CREW
FD 8 CO /NO CO
RSCENDING NODE
ORB: 97
MET: 006:00:24:04
LON: 136.6 E
5-60
05/14/82 STS4/FIN



05/14/82 SIS4/FIN

STS-4 DETAILED



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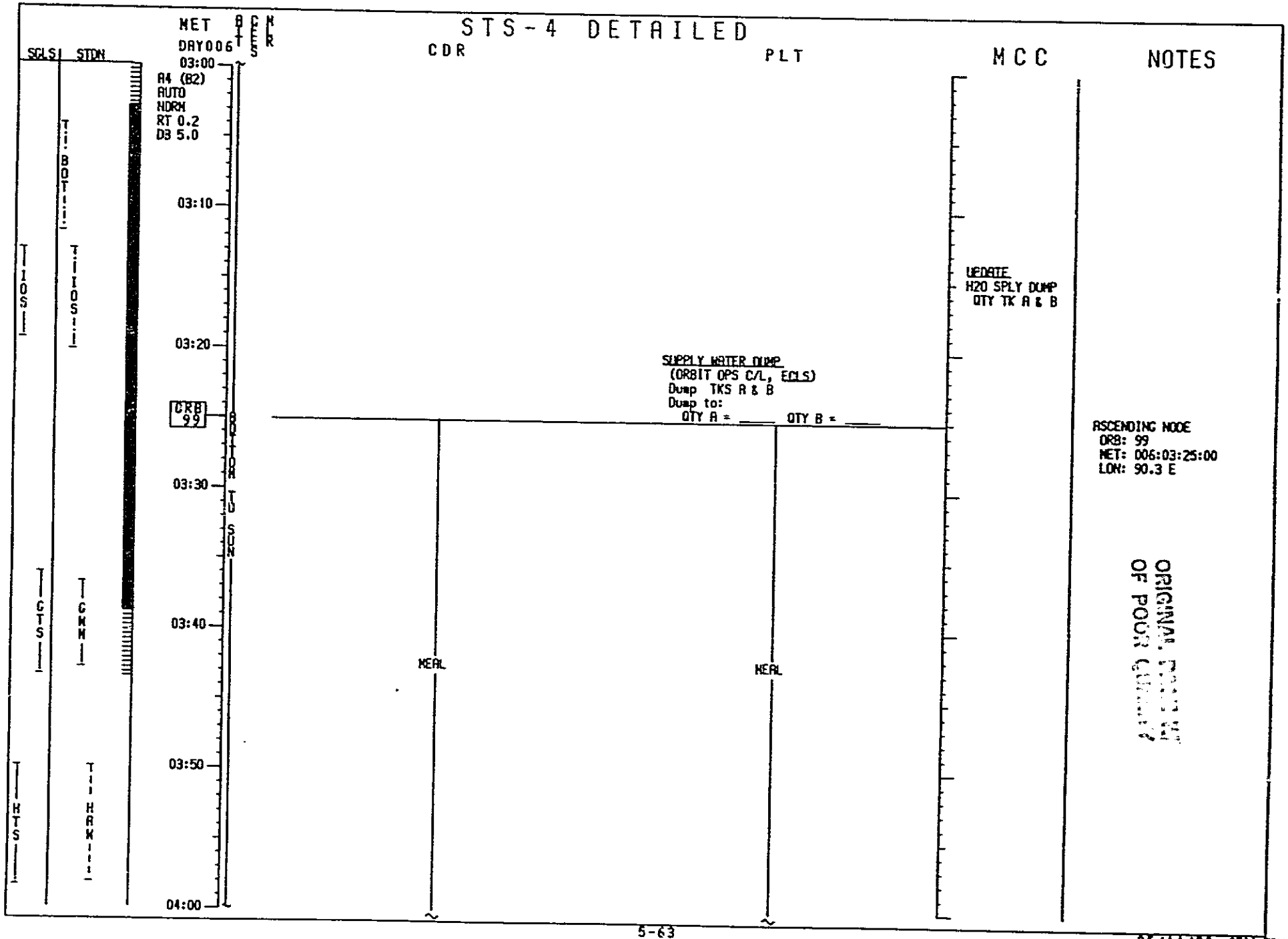

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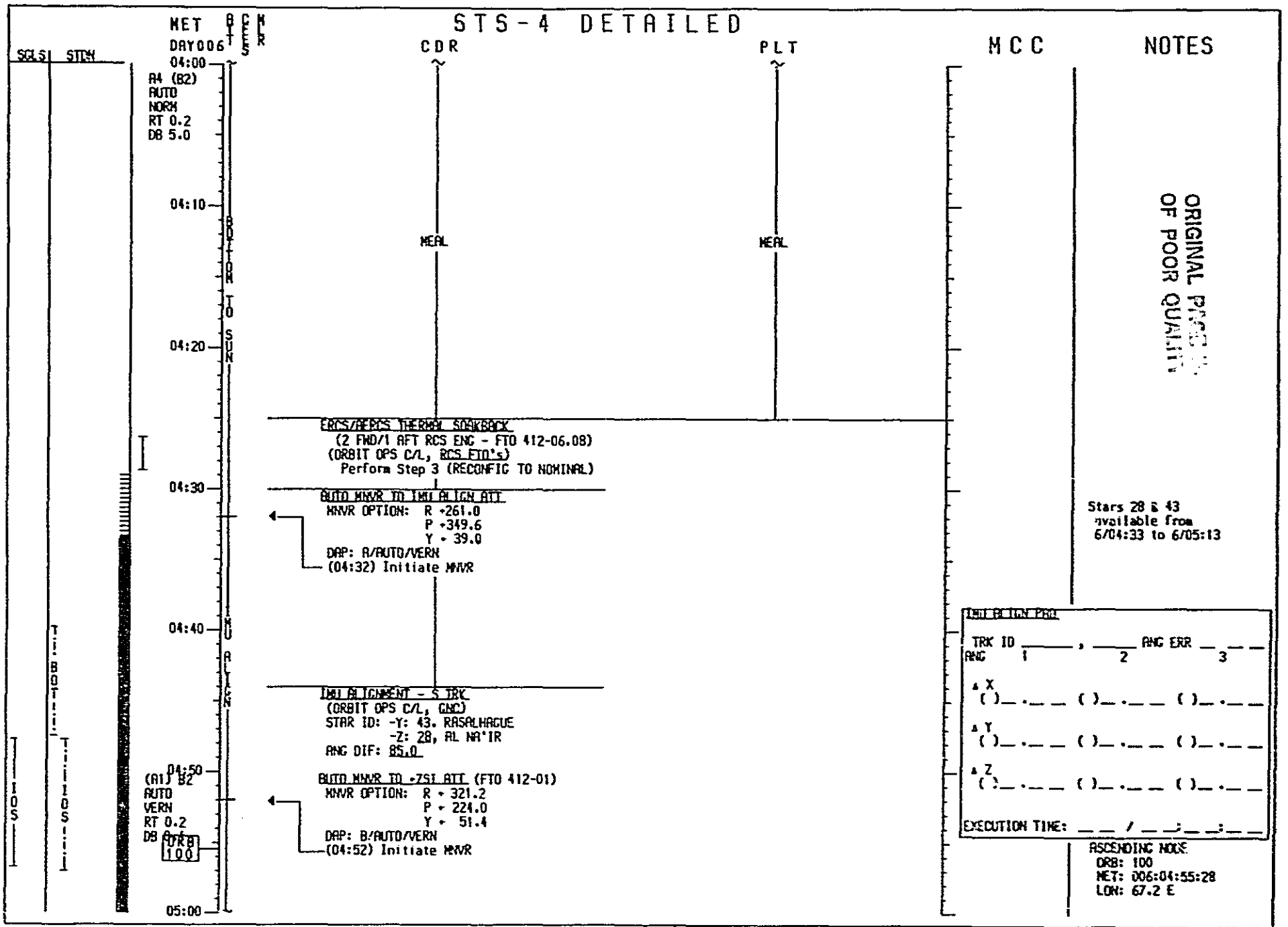
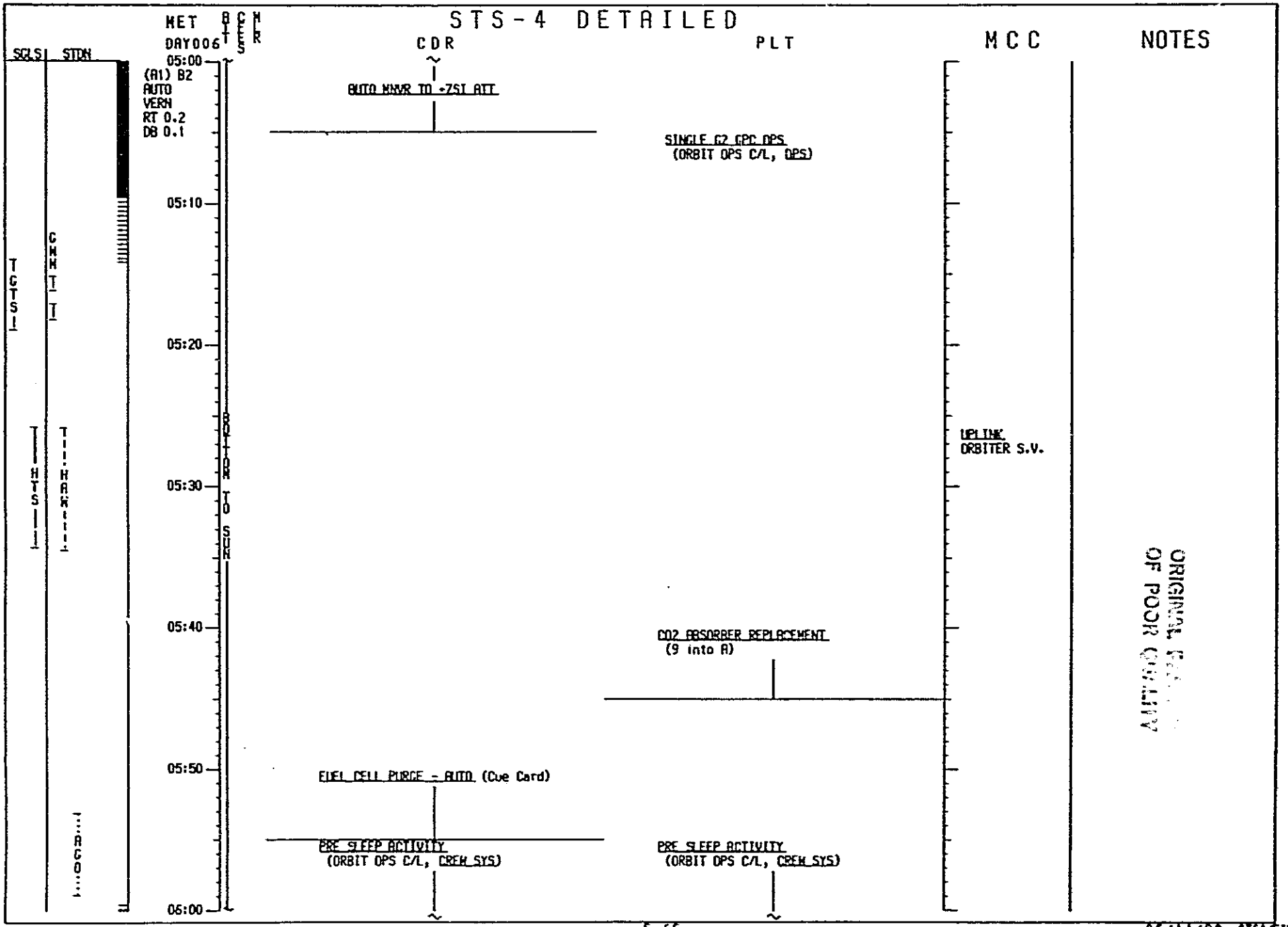
05/14/82 STS4/FIN

STS-4 DETAILED



05/14/82 STS4FIN

STS-4 DETRAILED



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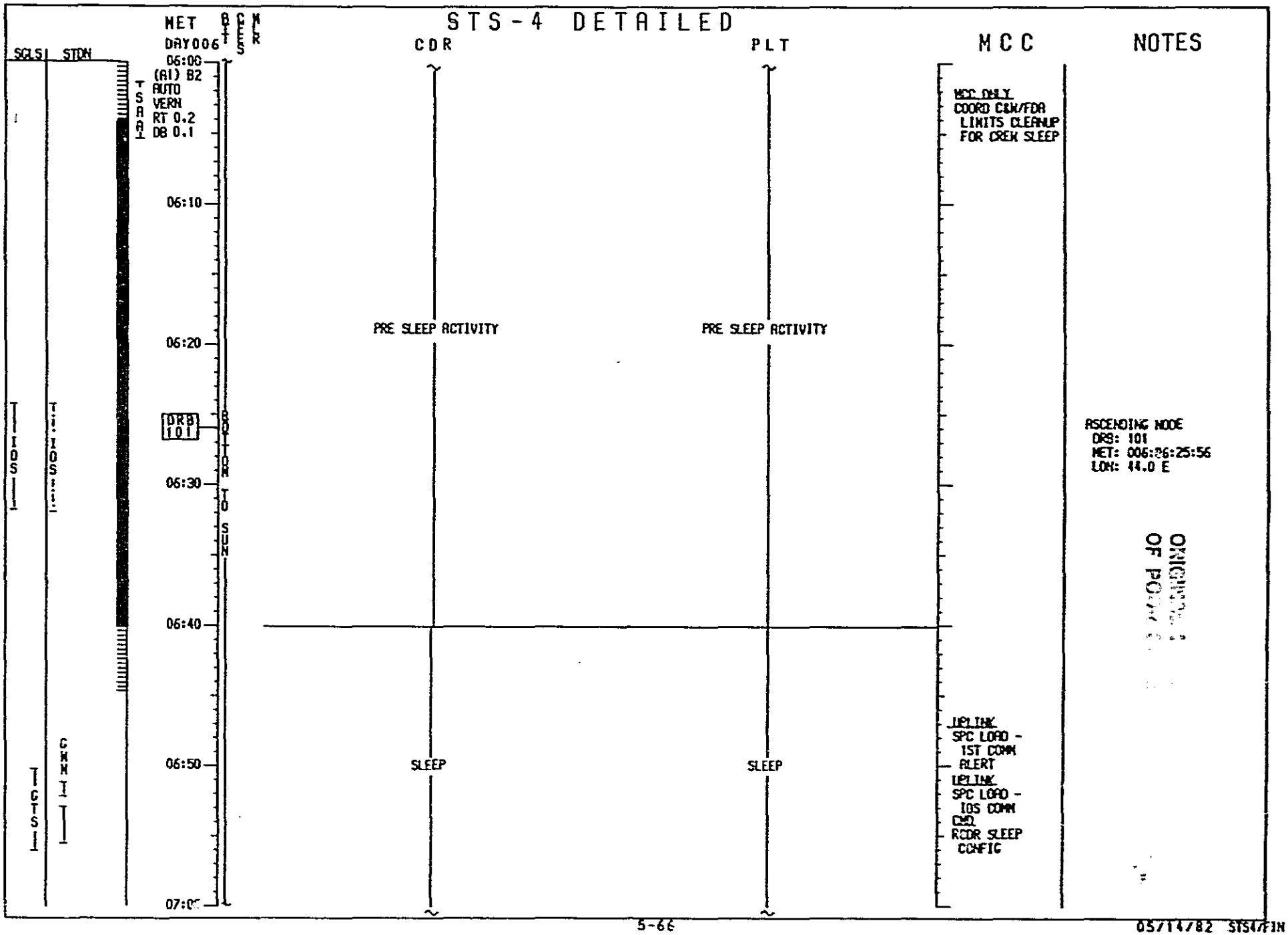

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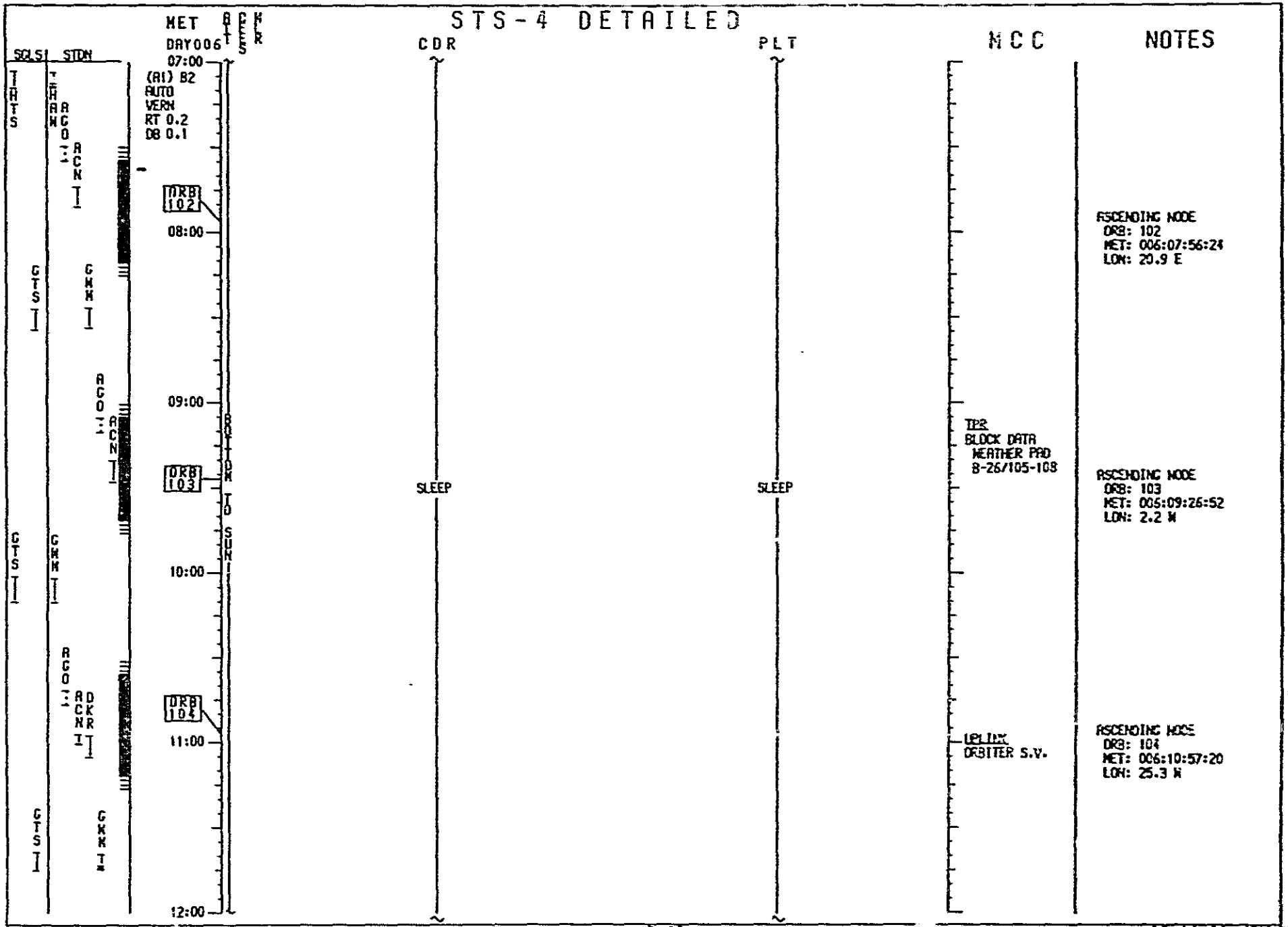
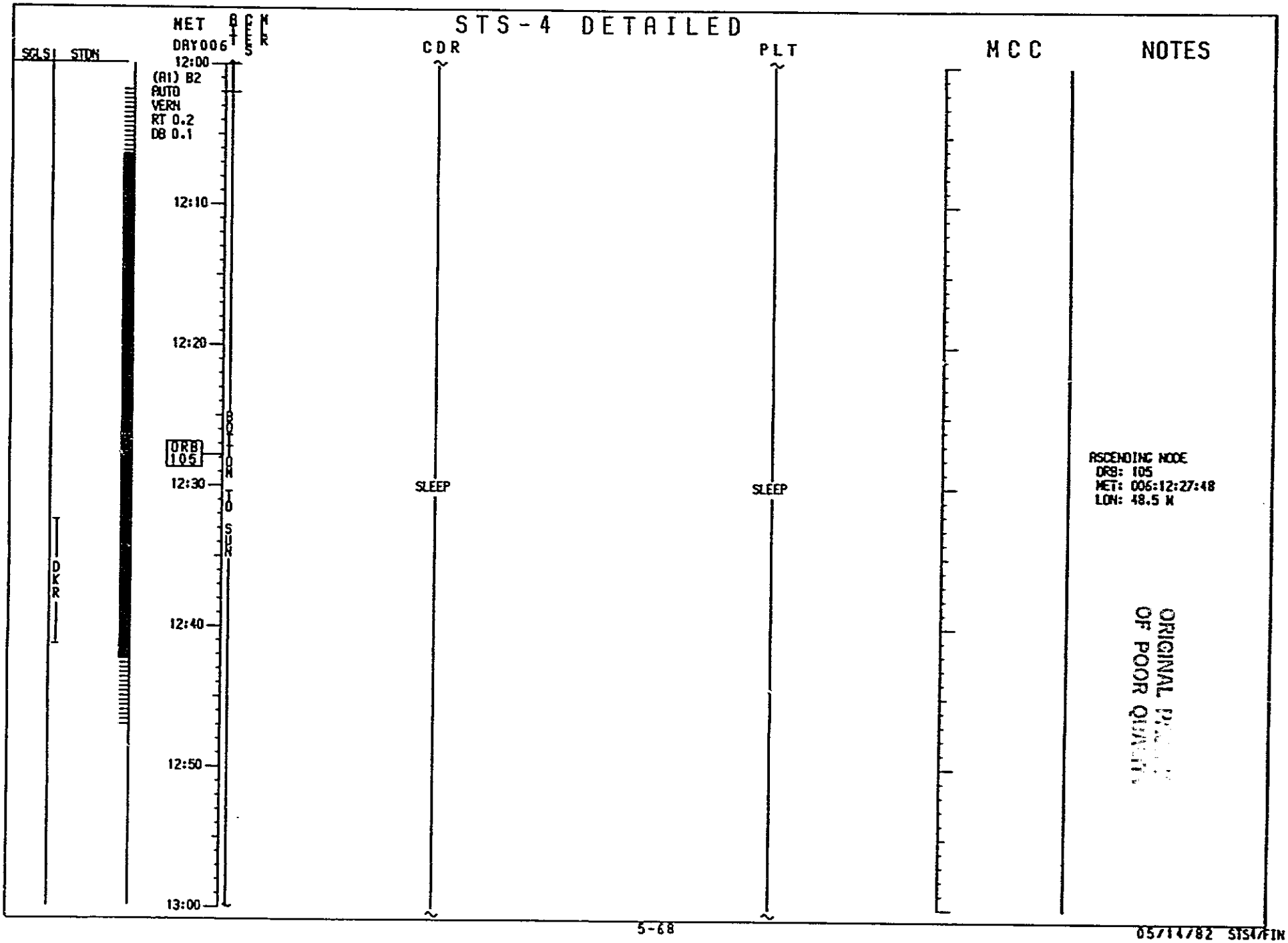
05/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY006
07:00
08:00
09:00
10:00
11:00
12:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 102
ORB 103
ORB 104
SLEEP
SLEEP
CDR
PLT
MCC
NOTES
ASCENDING NODE
ORB: 102
MET: 006:07:56:24
LON: 20.9 E
TP2
BLOCK DATA
WEATHER PRD
8-26/105-108
ASCENDING NODE
ORB: 103
MET: 006:09:26:52
LON: 2.2 W
UPLINK
ORBITER S.V.
ASCENDING NODE
ORB: 104
MET: 006:10:57:20
LON: 25.3 W
5-67
05714782 STS4FIN



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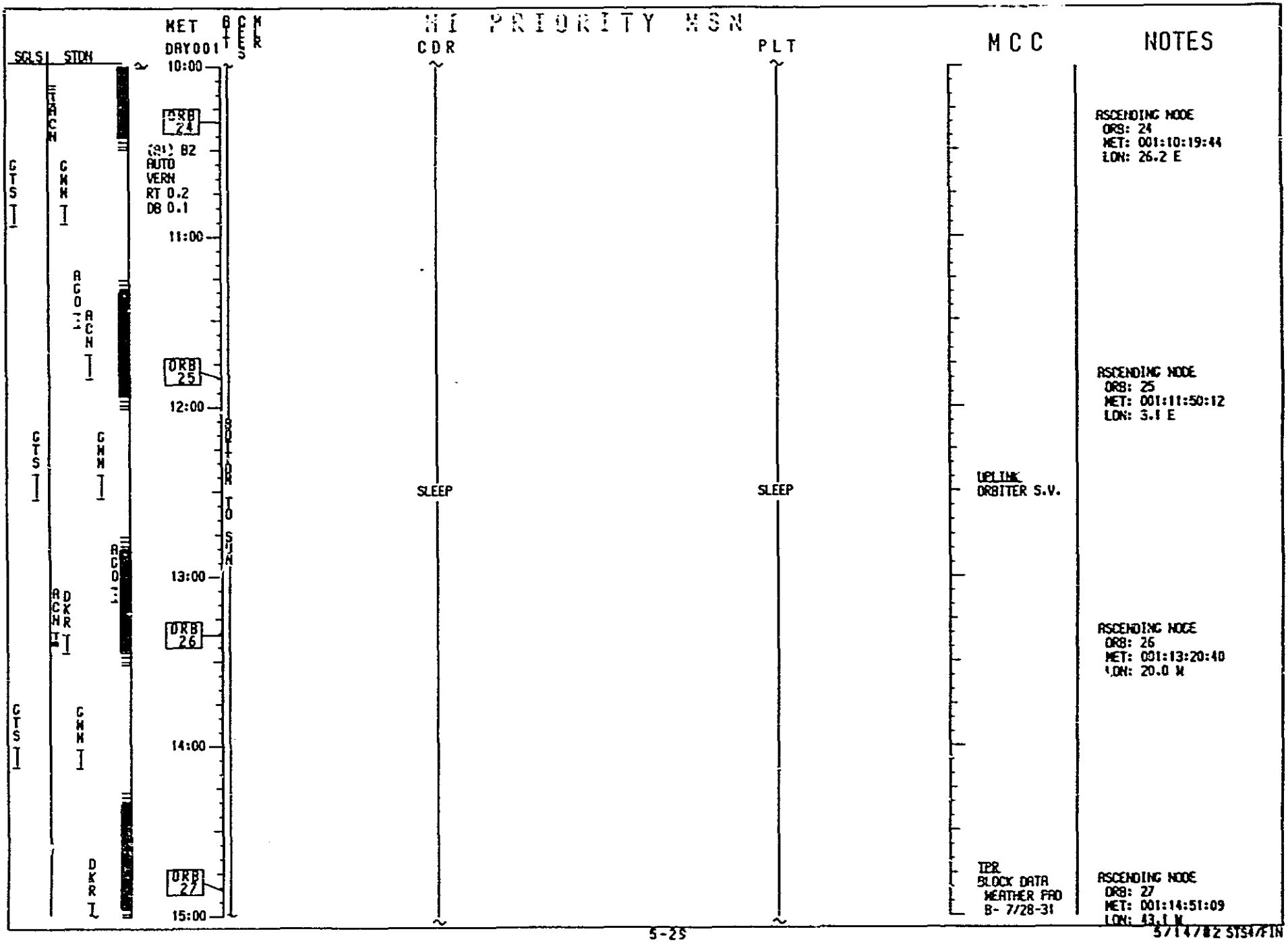
05/14/82 STS4FIN



C-3

5-25

5/14/82 STS4/FIN

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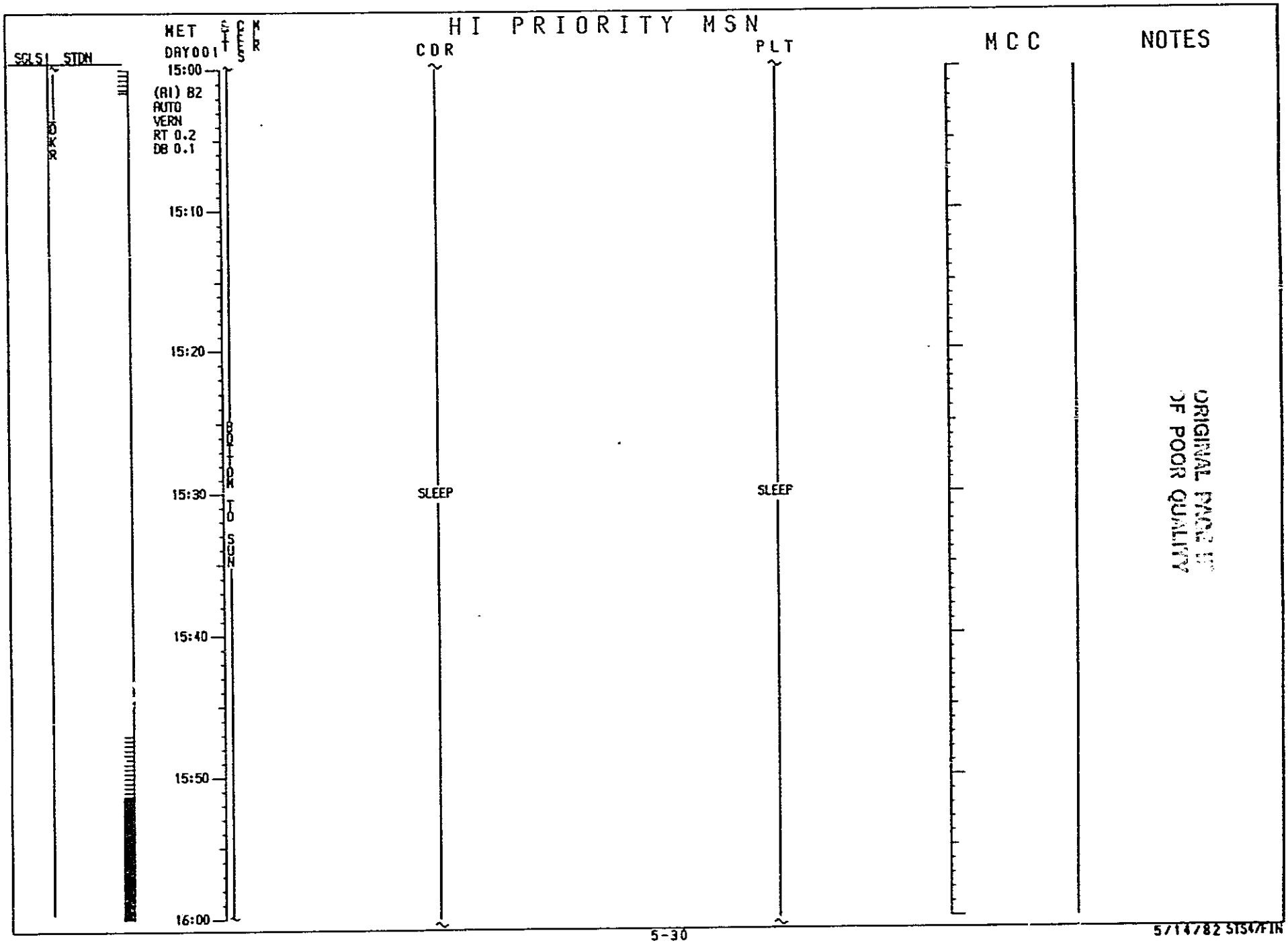
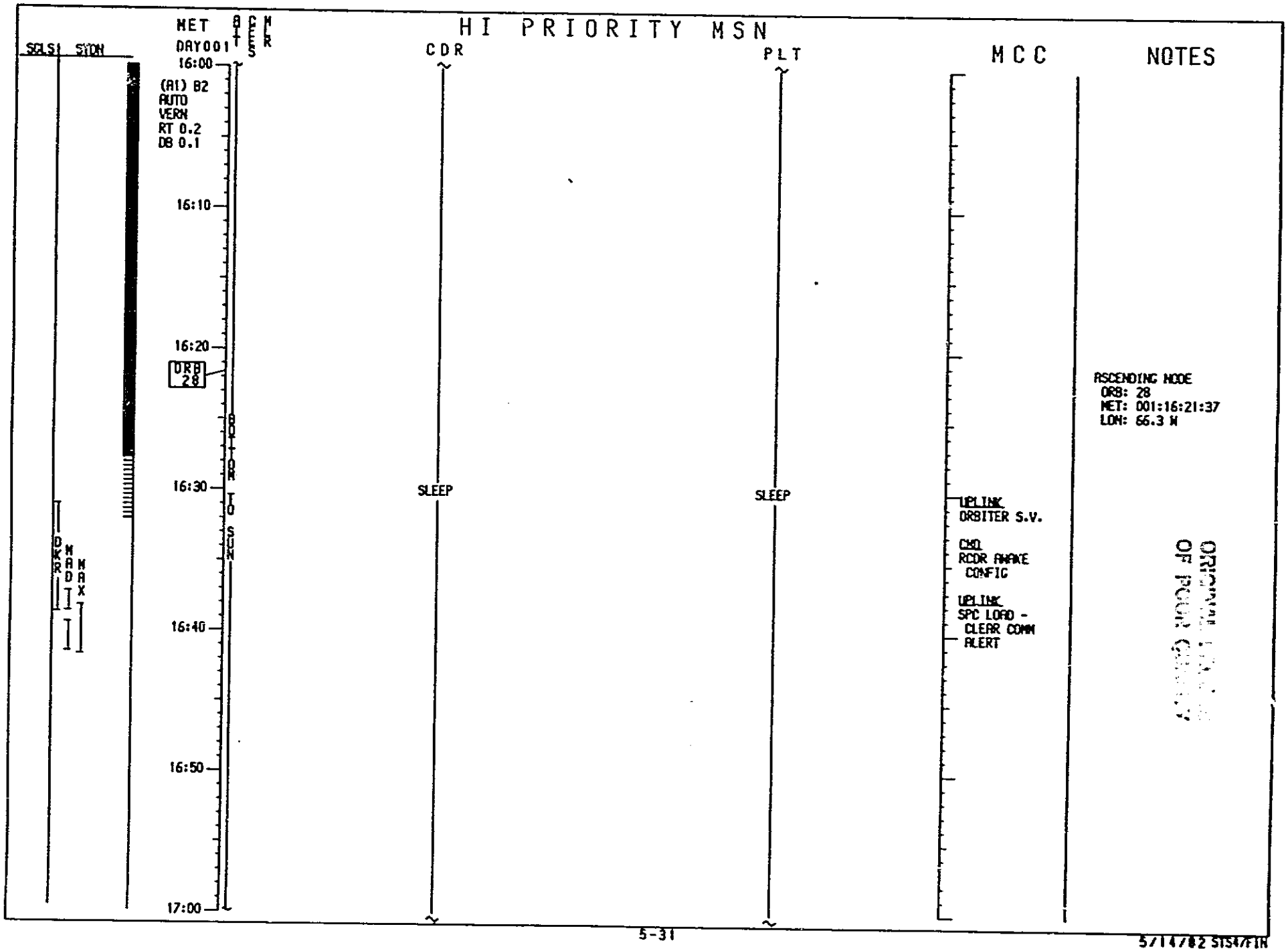
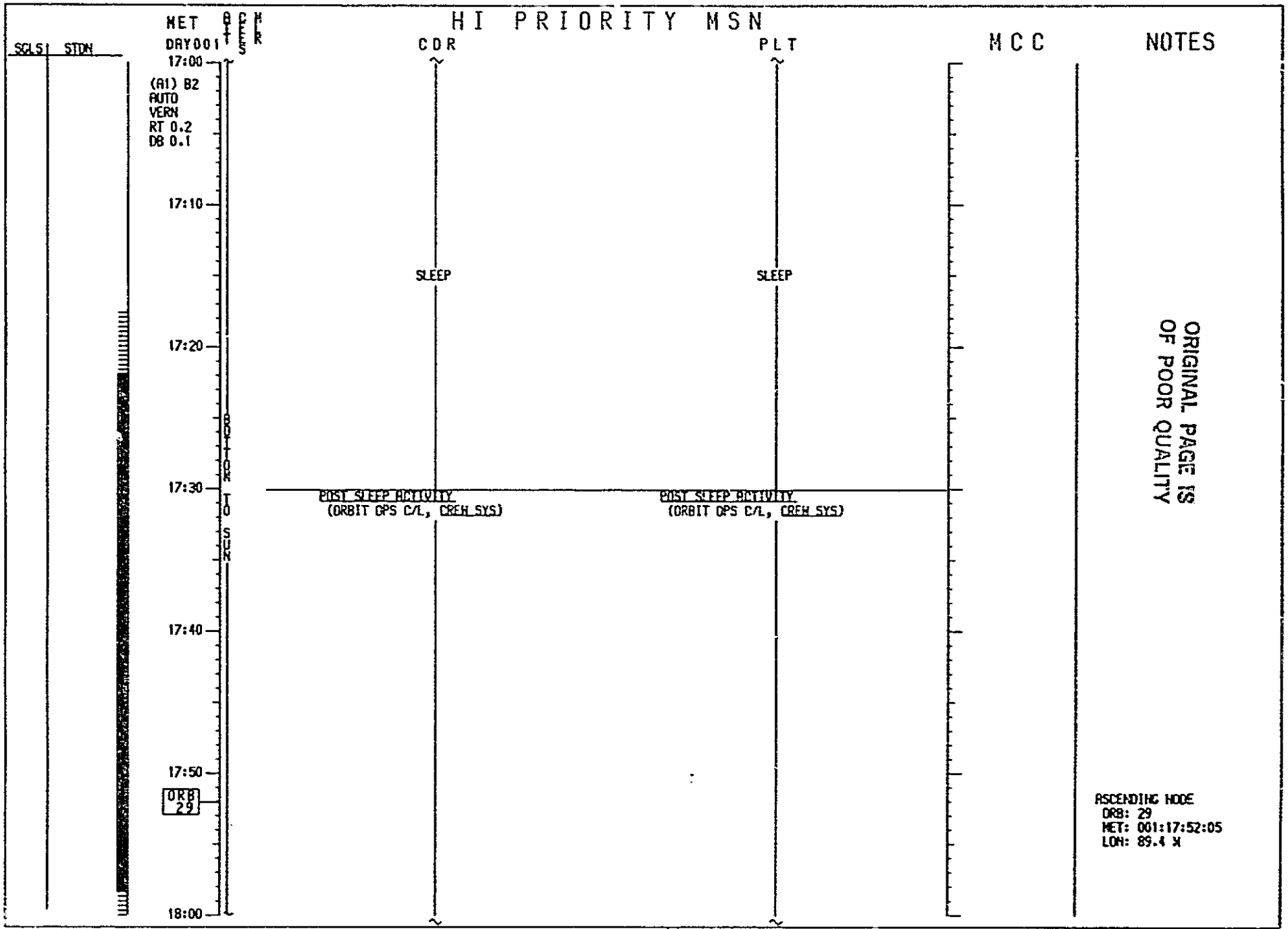


5/14/82 SIS4/FIN


SOLSI STON
MET
DAY001
ACCUMULATORS
HI PRIORITY MSN
CDR
PLT
MCC
NOTES
16:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
16:10
16:20
ORB
28
16:30
16:40
16:50
17:00
ROTATOR TO SSN
SLEEP
SLEEP
DOCK
MOD
MAX
UPLINK
ORBITER S.V.
C&D
RCDR AWAKE
CONFIG
UPLINK
SPC LOAD -
CLEAR COMM
ALERT
ASCENDING NODE
ORB: 28
MET: 001:16:21:37
LON: 66.3 W
5-31
5/14/82 SIS4/FIN



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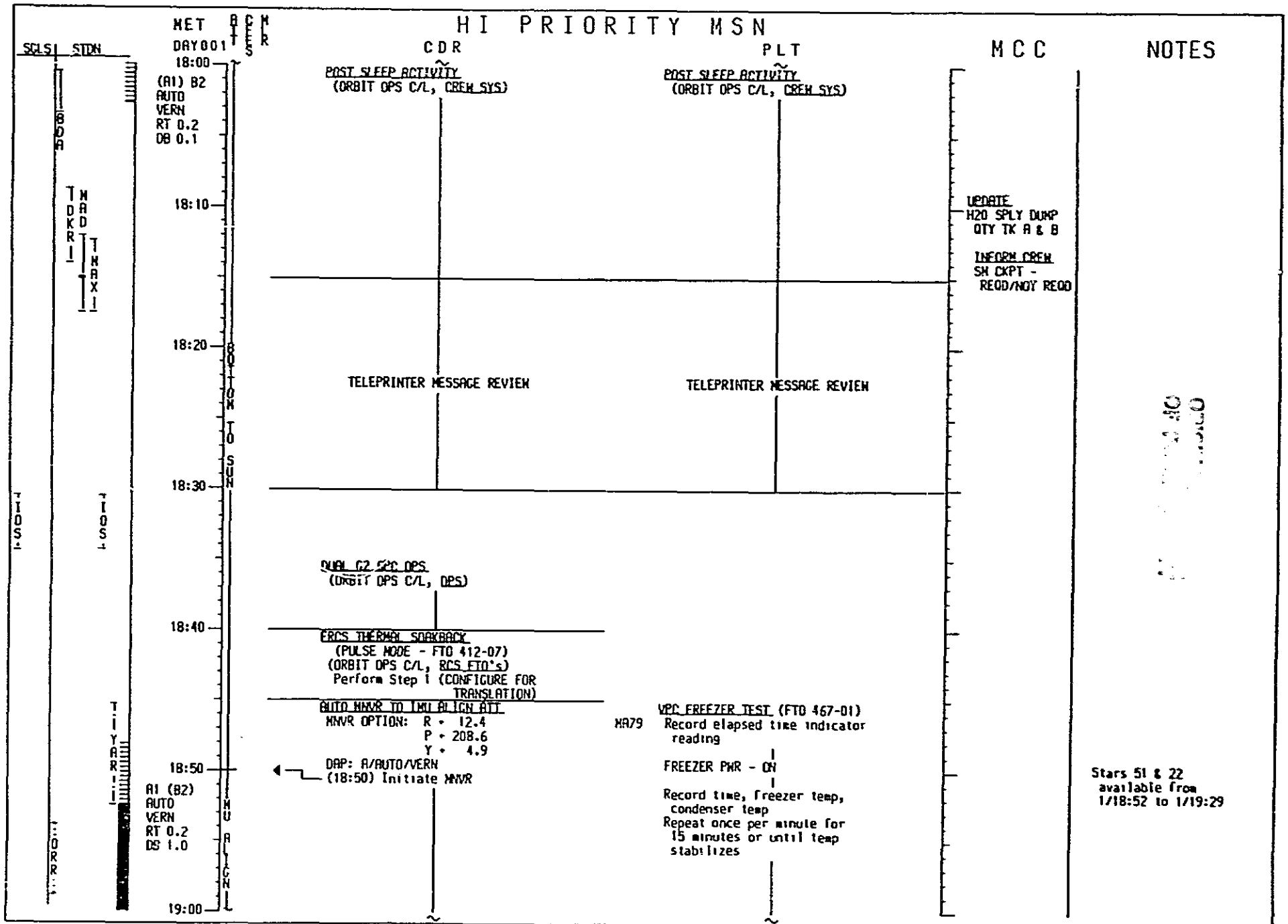
5/14/82 STS4/FIN



5714782 STS4-FIN

HI PRIORITY MSN

SGLS | STDN | MET DAY001 | ATT | CNTR | CDR | PLT | MCC NOTES

19:00
AI (B2)
AUTO
VERN
RT 0.2
DB 1.0

MIL TILS TILX BDA TDRS TDRE MAD MAX

MNVR ATTITUDE

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 51, ATRIA
-Z: 22, ALTAIR
ANG DIF: 84.0

VPC FREEZER TEST (FTO 467-01)

WATER SAMPLE FREEZING
Mxxx Unstow H2O sasple container and fill with H2O
MA96 Insert container into freezer,
Record time ___ / ___ : ___

IMU ALIGN PAD
TRK ID ____ , ____ ANG ERR __.__ __
RNG 1 2 3
ΔX ( )__.__ __ ( )__.__ __ ( )__.__ __
ΔY ( )__.__ __ ( )__.__ __ ( )__.__ __
ΔZ ( )__.__ __ ( )__.__ __ ( )__.__ __
EXECUTION TIME: __ __ / __ __:__ __:__ __

19:10
(AI) B2
AUTO
VERN
RT 0.2
DB 0.1

AUTO MNVR TO -ZSI ATT (FTO 412-01)
MNVR OPTION: R + 309.1
P + 234.6
Y + 59.4
DAP: B/AUTO/VERN
(19:10) Initiate MNVR

Changeout wireless headset battery pack

19:20
ORB 30

ASCENDING NODE
ORB: 30
MET: 001:19:22:33
LON: 112.6 W

EC PURGE - MANUAL (Cue Card)

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____

19:30

REPORT: IMU ALIGN RESULTS

RPT: IMU ALIGN RESULTS __

19:40

MEAL

MEAL

19:50

20:00

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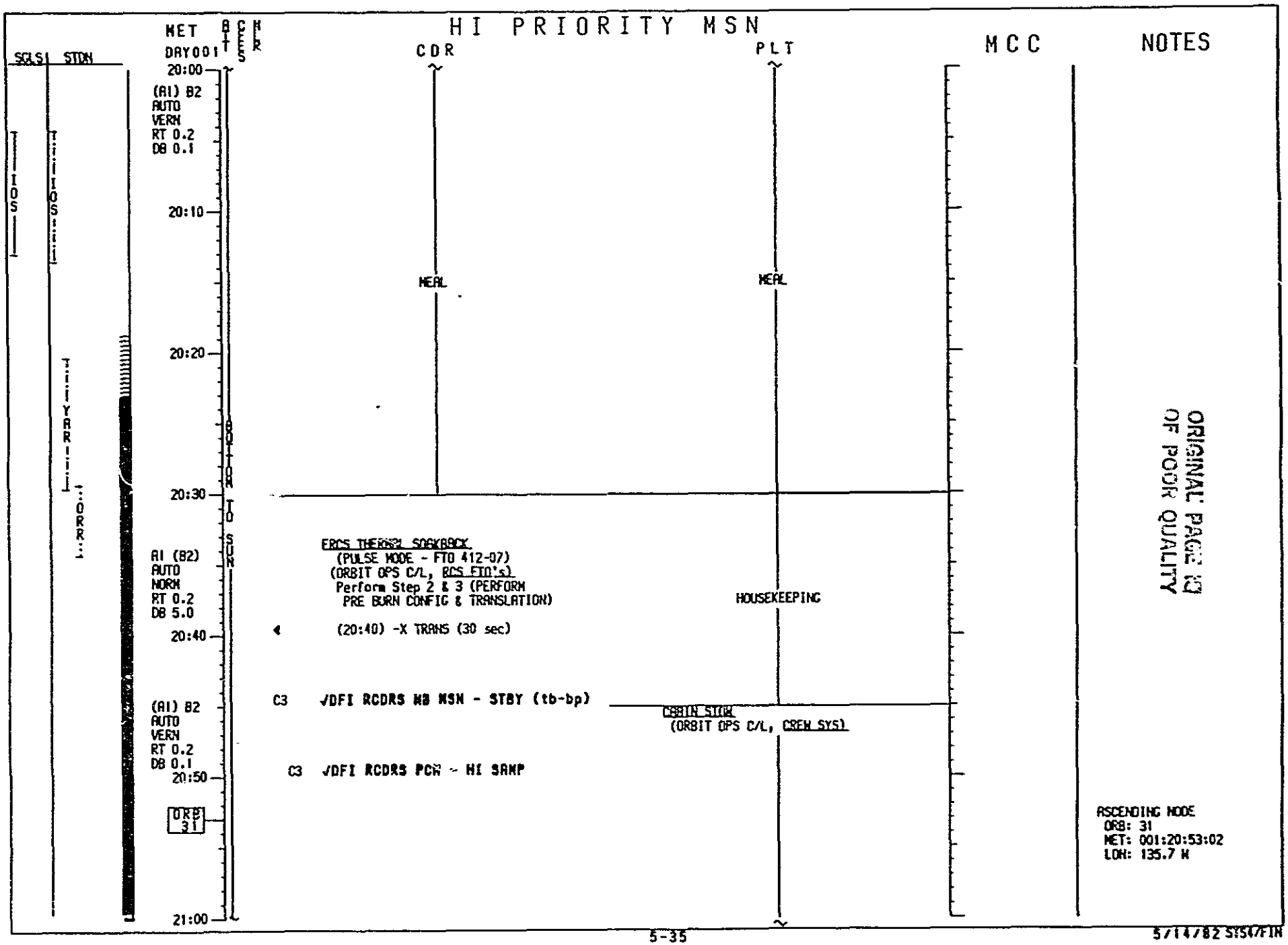
HI PRIORITY MSN
MET
DAY 001
SGLS
STDN
CDR
PLT
MCC
NOTES
20:00
20:10
20:20
20:30
20:40
20:50
21:00
(AI) B2
AUTO
VERN
RT 0.2
DB 0.1
AI (B2)
AUTO
NORM
RT 0.2
DB 5.0
(AI) B2
AUTO
VERN
RT 0.2
DB 0.1
ORB 31
MEAL
MEAL
ERCS THERMAL SOAKBACK
(PULSE MODE - FTO 412-07)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 2 & 3 (PERFORM
PRE BURN CONFIG & TRANSLATION)
(20:40) -X TRANS (30 sec)
HOUSEKEEPING
C3 /DFI RCDRS HB MSN - STBY (tb-bp)
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
C3 /DFI RCDRS PCM - HI SAMP
ASCENDING NODE
ORB: 31
MET: 001:20:53:02
LON: 135.7 W
ORIGINAL PAGE IS
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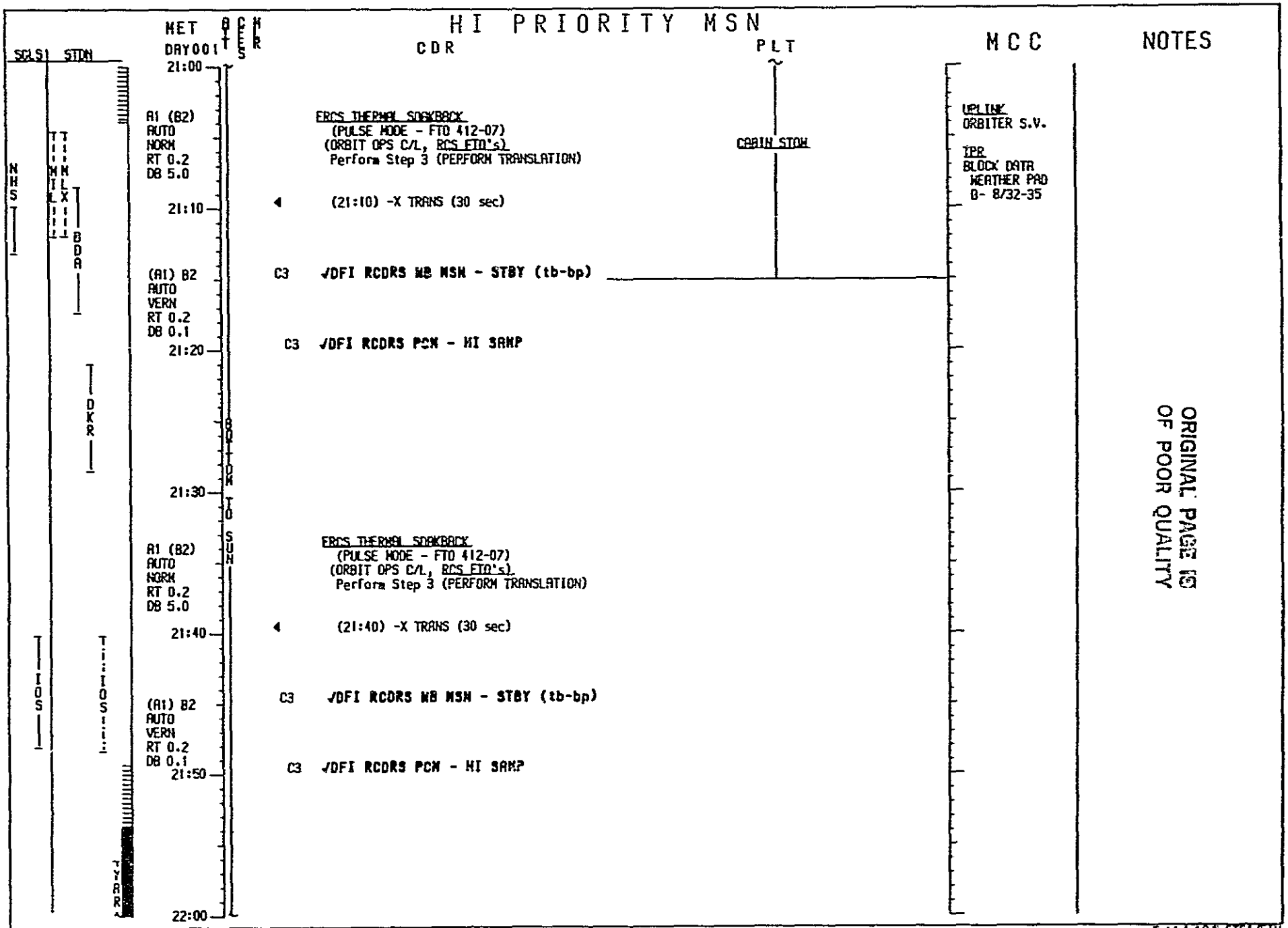
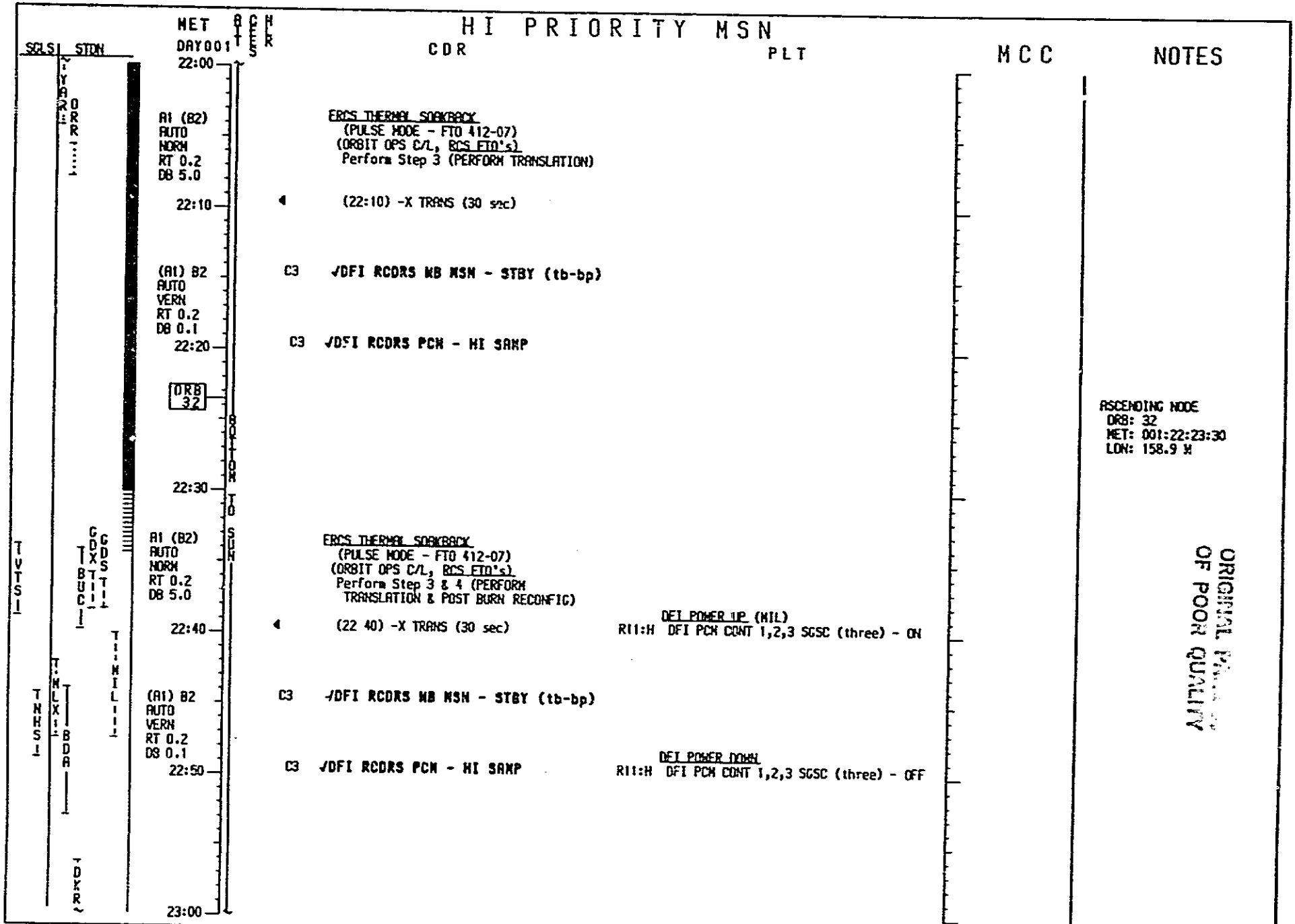

HI PRIORITY MSN
SGLS
STDN
MET
DAY 001
BACK TO SUN
CDR
PLT
MCC
NOTES
21:00
21:10
21:20
21:30
21:40
21:50
22:00
A1 (B2)
AUTO
NORM
RT 0.2
DB 5.0
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ERCS THERMAL SOAKBACK
(PULSE MODE - FTD 412-07)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 3 (PERFORM TRANSLATION)
(21:10) -X TRANS (30 sec)
C3 /DFI RCDRS HB MSN - STBY (tb-bp)
C3 /DFI RCDRS PCN - HI SAMP
(21:40) -X TRANS (30 sec)
CABIN STOW
UPLINK
ORBITER S.V.
TPR
BLOCK DATA
WEATHER PAD
B- 8/32-35
NHS
TILE
MILA
MILX
BDA
DKR
TDRSE
TDRSW
TDRSS
TDRSA
ORIGINAL PAGE IS
OF POOR QUALITY

HI PRIORITY MSN



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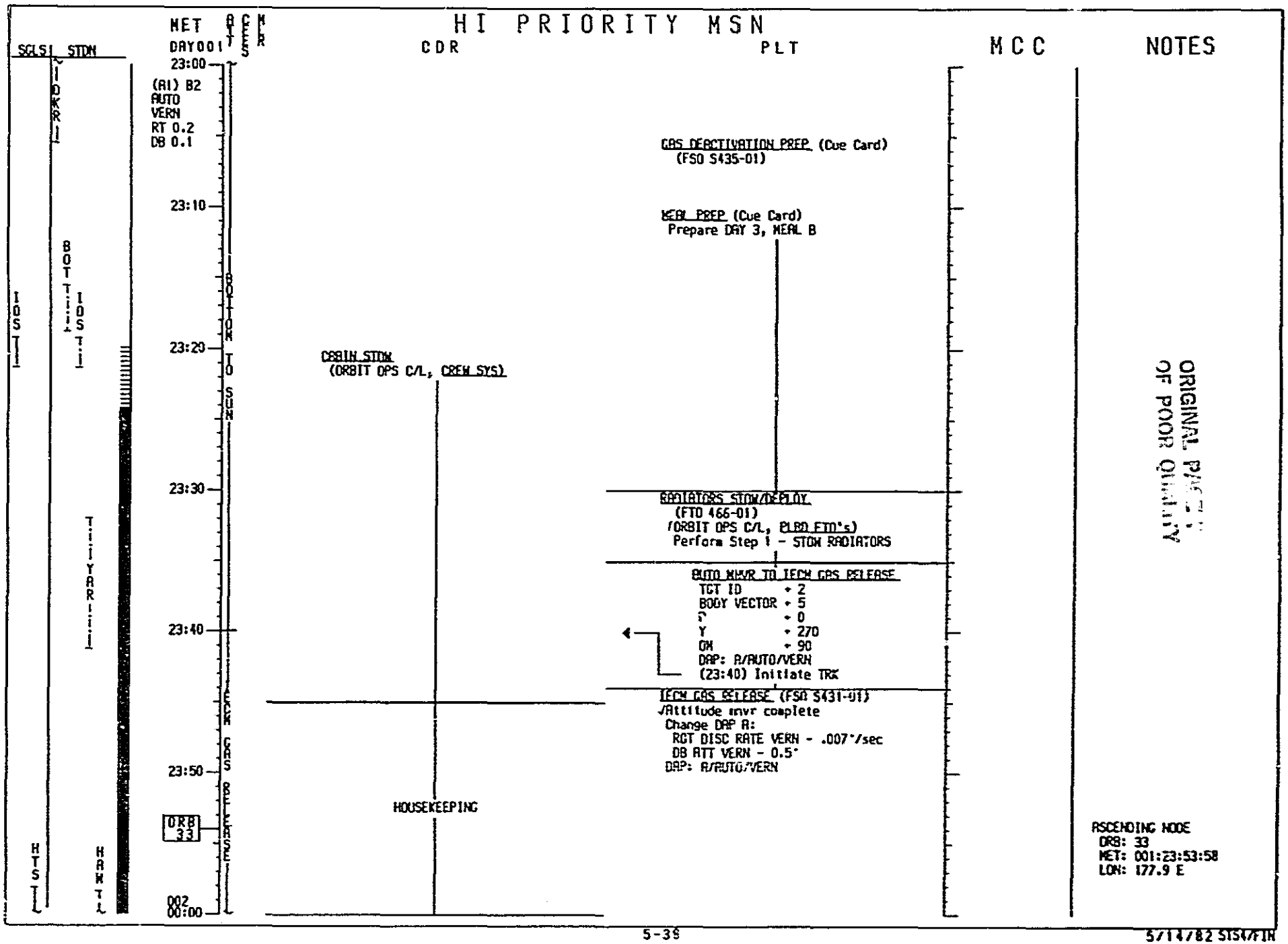
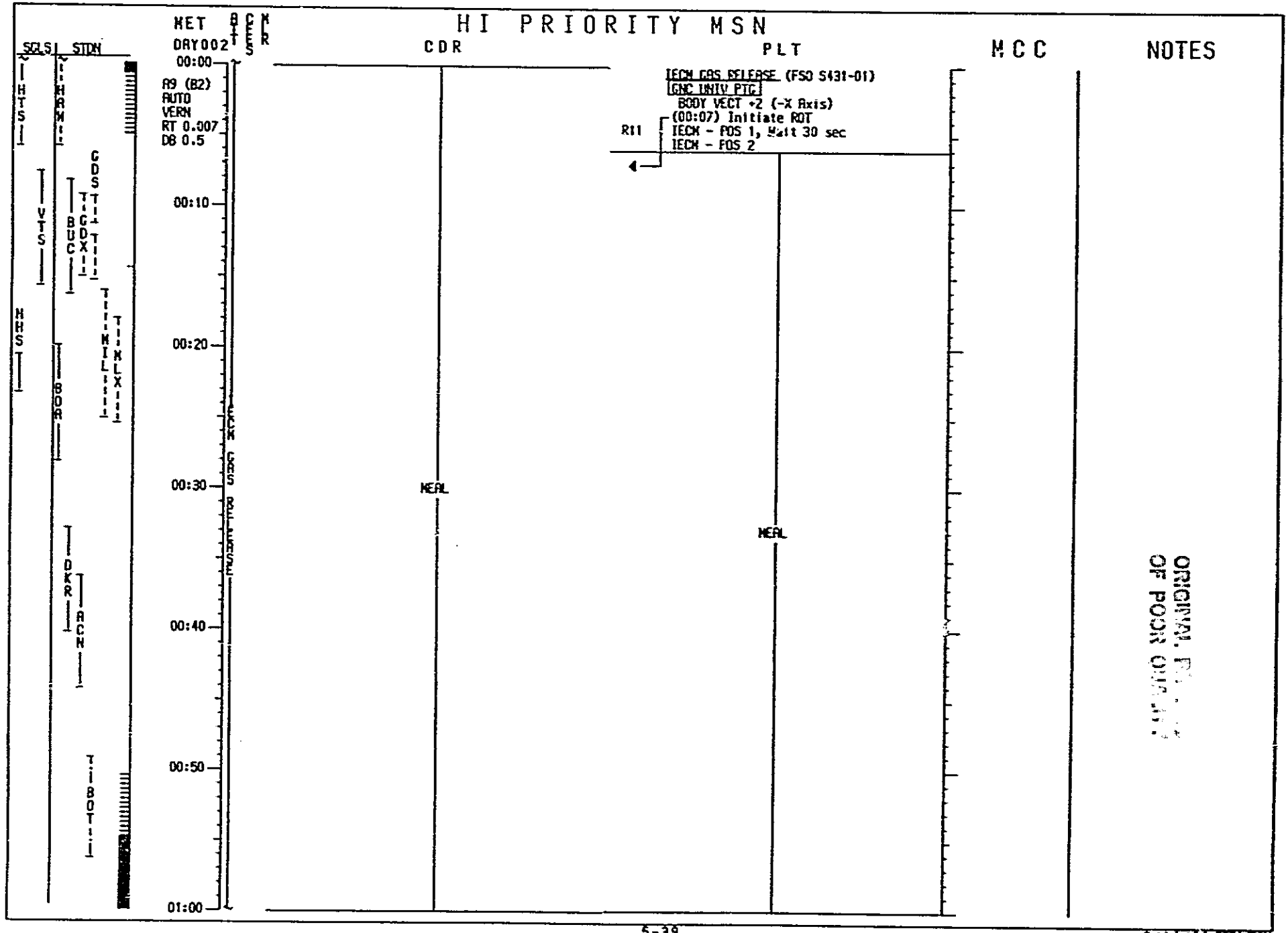
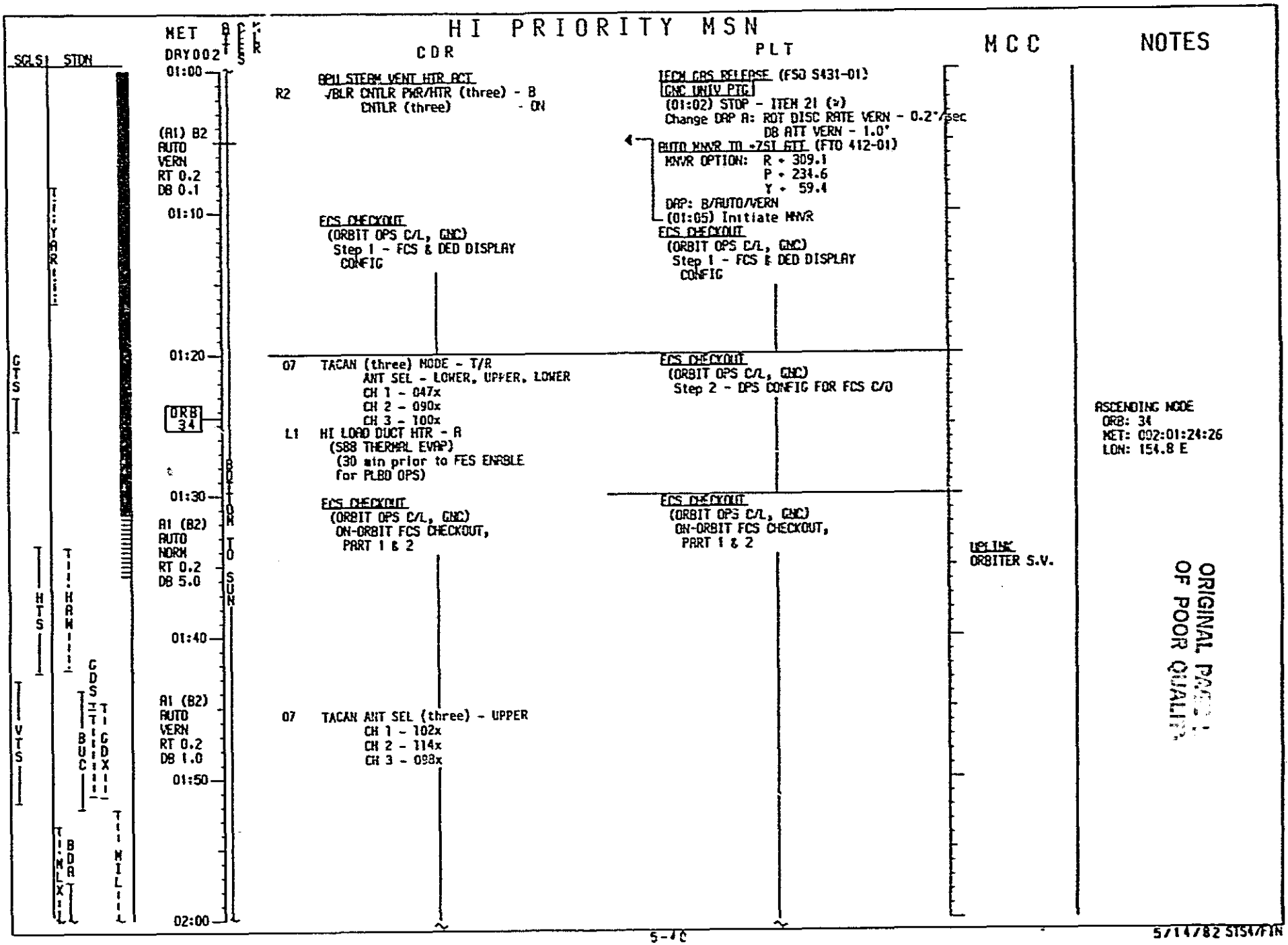


5/14/82 STS4/FIN

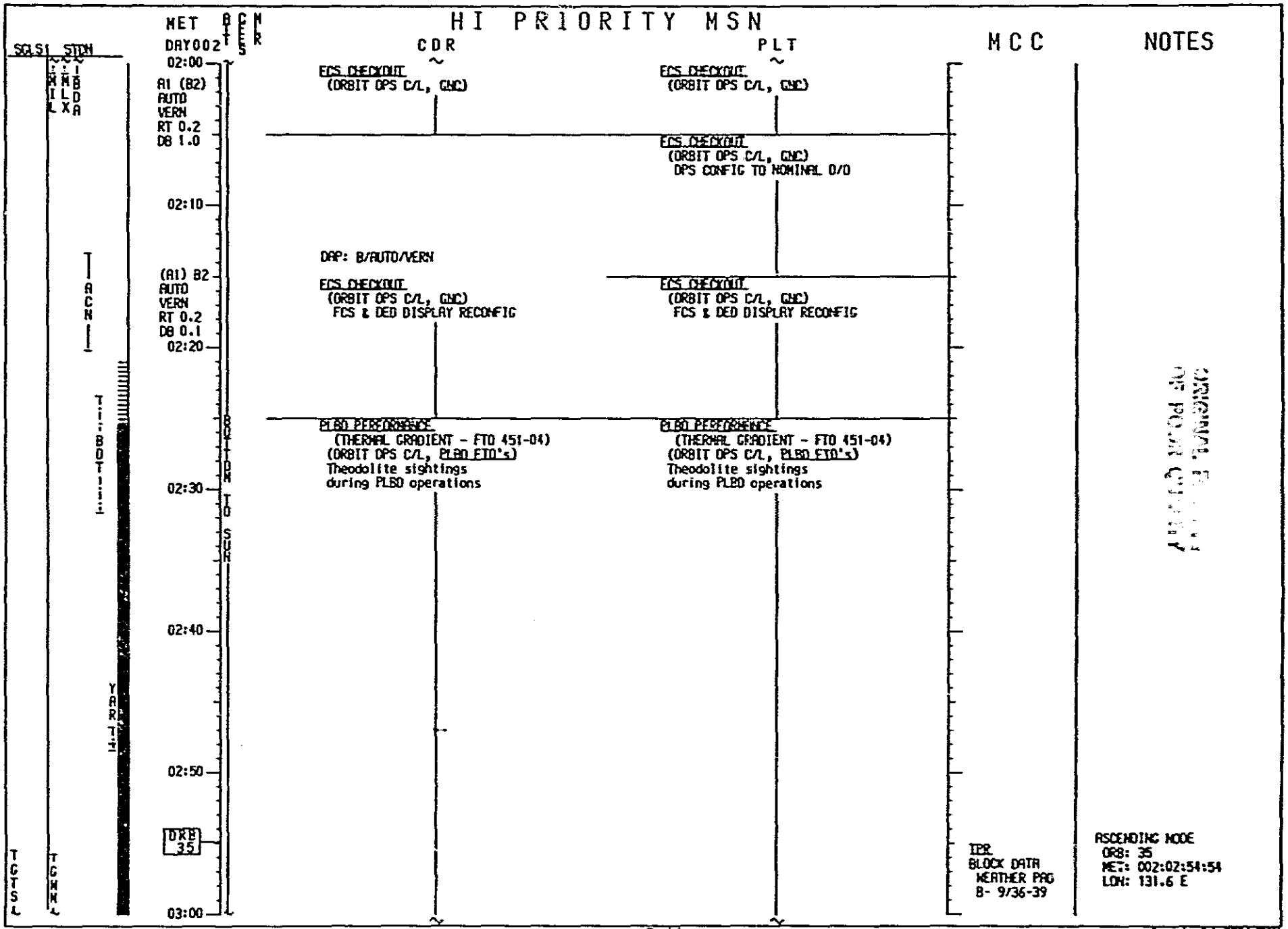


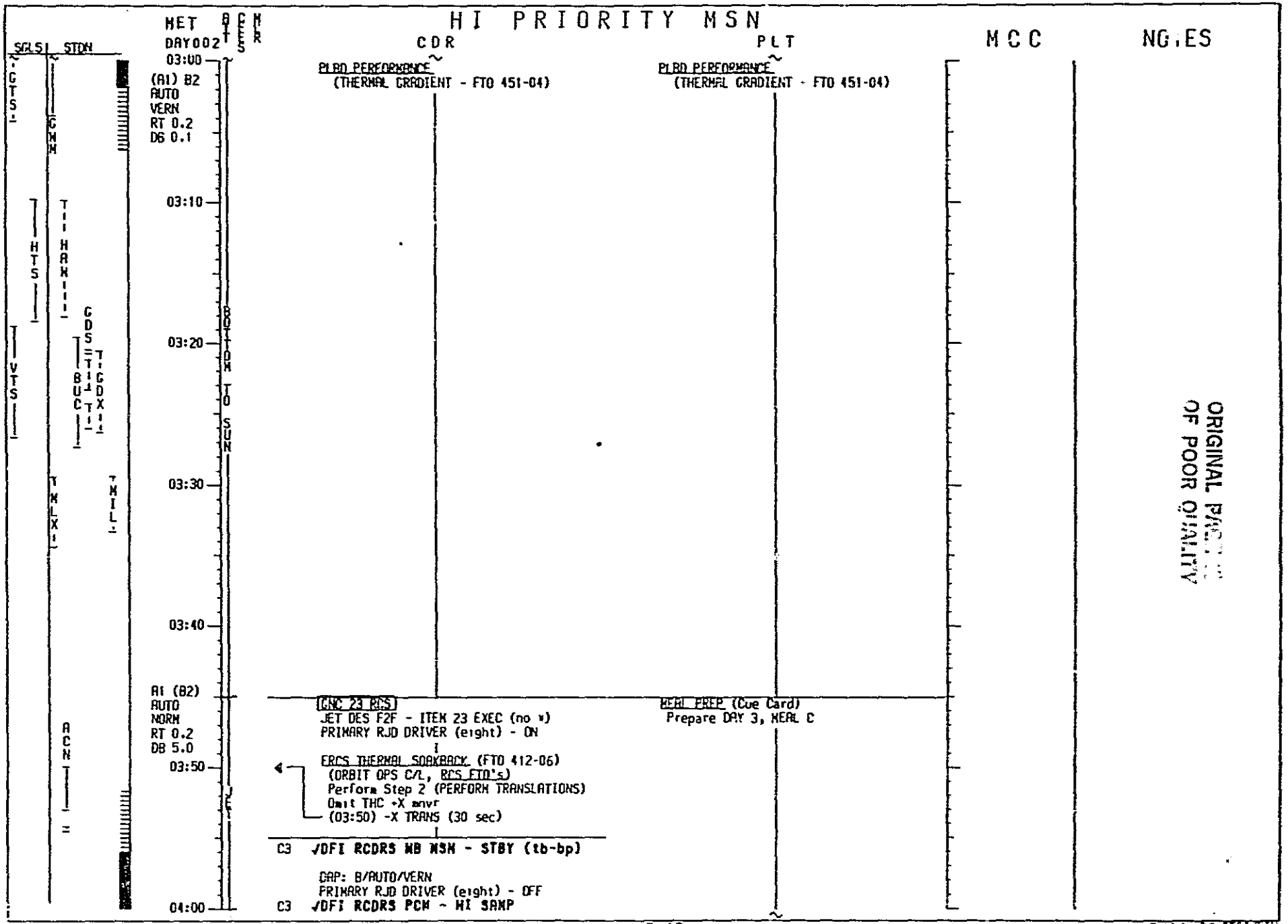
5/14/82 STS4/FIN

HI PRIORITY MSN



5/14/82 STS4/FIN


HI PRIORITY MSN
MET
DAY 002
CDR
PLT
MCC
NOTES
SGLS STDN
ACMR
02:00
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
ECS CHECKOUT
(ORBIT OPS C/L, GNC)
ECS CHECKOUT
(ORBIT OPS C/L, GNC)
ECS CHECKOUT
(ORBIT OPS C/L, GNC)
DPS CONFIG TO NOMINAL O/O
02:10
DAP: B/AUTO/VERN
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
02:20
ECS CHECKOUT
(ORBIT OPS C/L, GNC)
FCS & DED DISPLAY RECONFIG
ECS CHECKOUT
(ORBIT OPS C/L, GNC)
FCS & DED DISPLAY RECONFIG
PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations
PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations
02:30
02:40
02:50
ORB
35
03:00
TGTS
TGNN
ACN
TDRS
YAR
IPR
BLOCK DATA
WEATHER PAO
B- 9/36-39
ASCENDING NODE
ORB: 35
MET: 002:02:54:54
LON: 131.6 E


HI PRIORITY MSN
MET
DAY002
CDR
PLT
MCC
NG,ES
SCLS
STDN
03:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
03:10
03:20
03:30
03:40
A1 (B2)
AUTO
NORM
RT 0.2
DB 5.0
03:50
04:00
PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
CNC 23 RCS
JET DES F2F - ITEM 23 EXEC (no ∗)
PRIMARY RJD DRIVER (eight) - ON
ERCS THERMAL SOAKBACK (FTO 412-06)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 2 (PERFORM TRANSLATIONS)
Omit THC +X anvr
(03:50) -X TRANS (30 sec)
C3 /DFI RCDRS MB MSN - STBY (tb-bp)
DAP: B/AUTO/VERN
PRIMARY RJD DRIVER (eight) - OFF
C3 /DFI RCDRS PCM - HI SAMP
REAL PREP (Cue Card)
Prepare DAY 3, REAL C
ROTATION TO SUN
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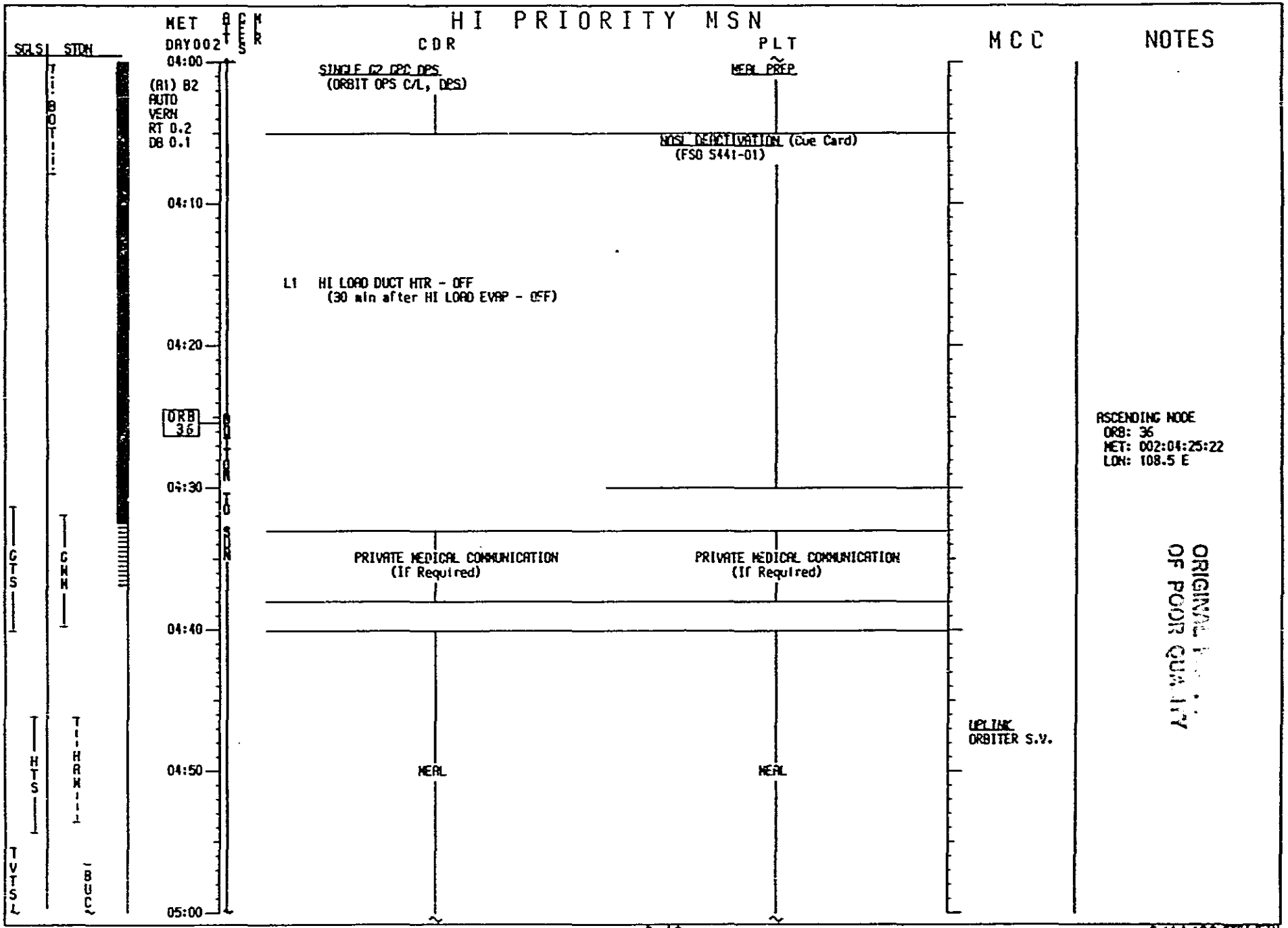

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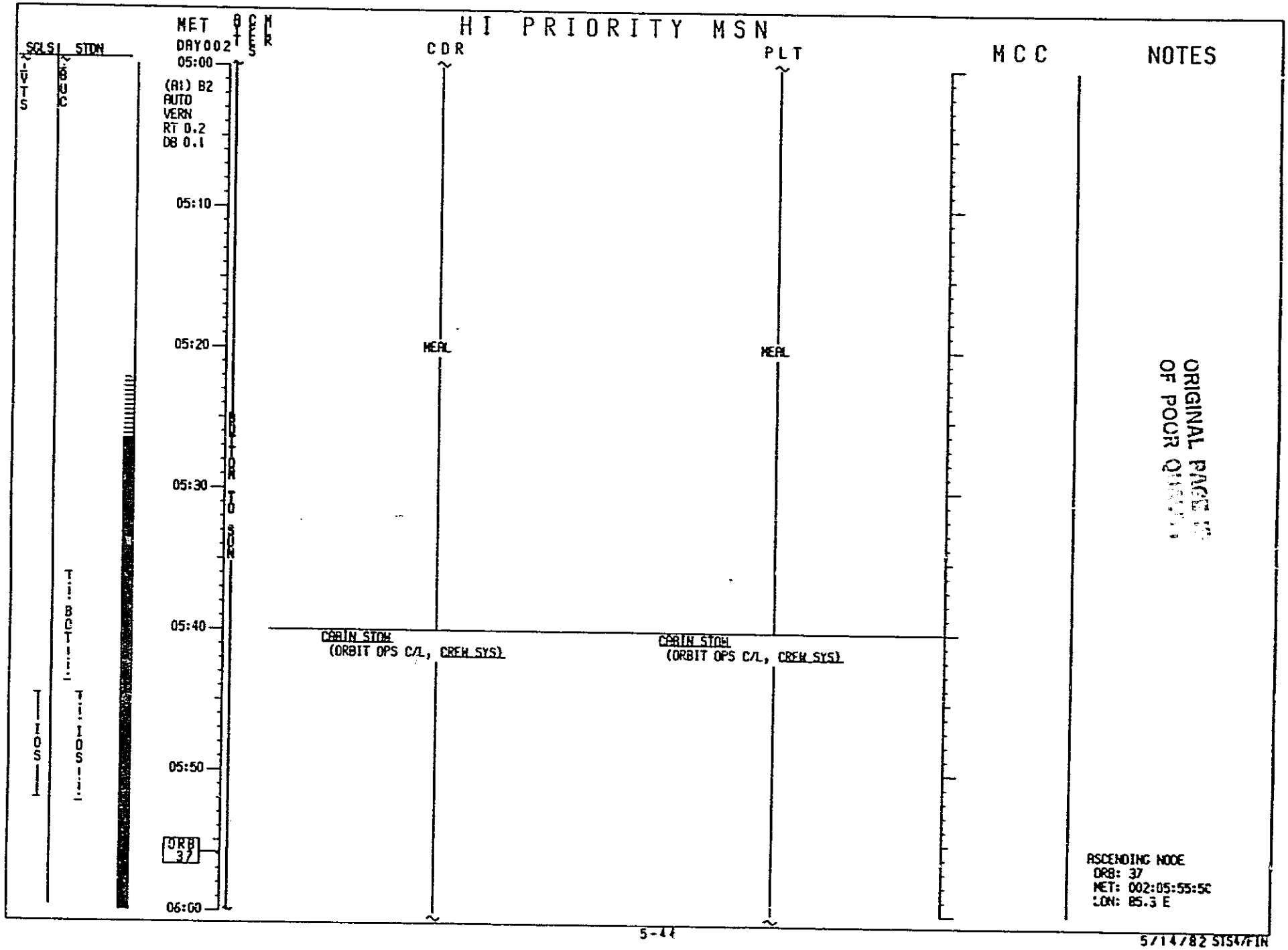

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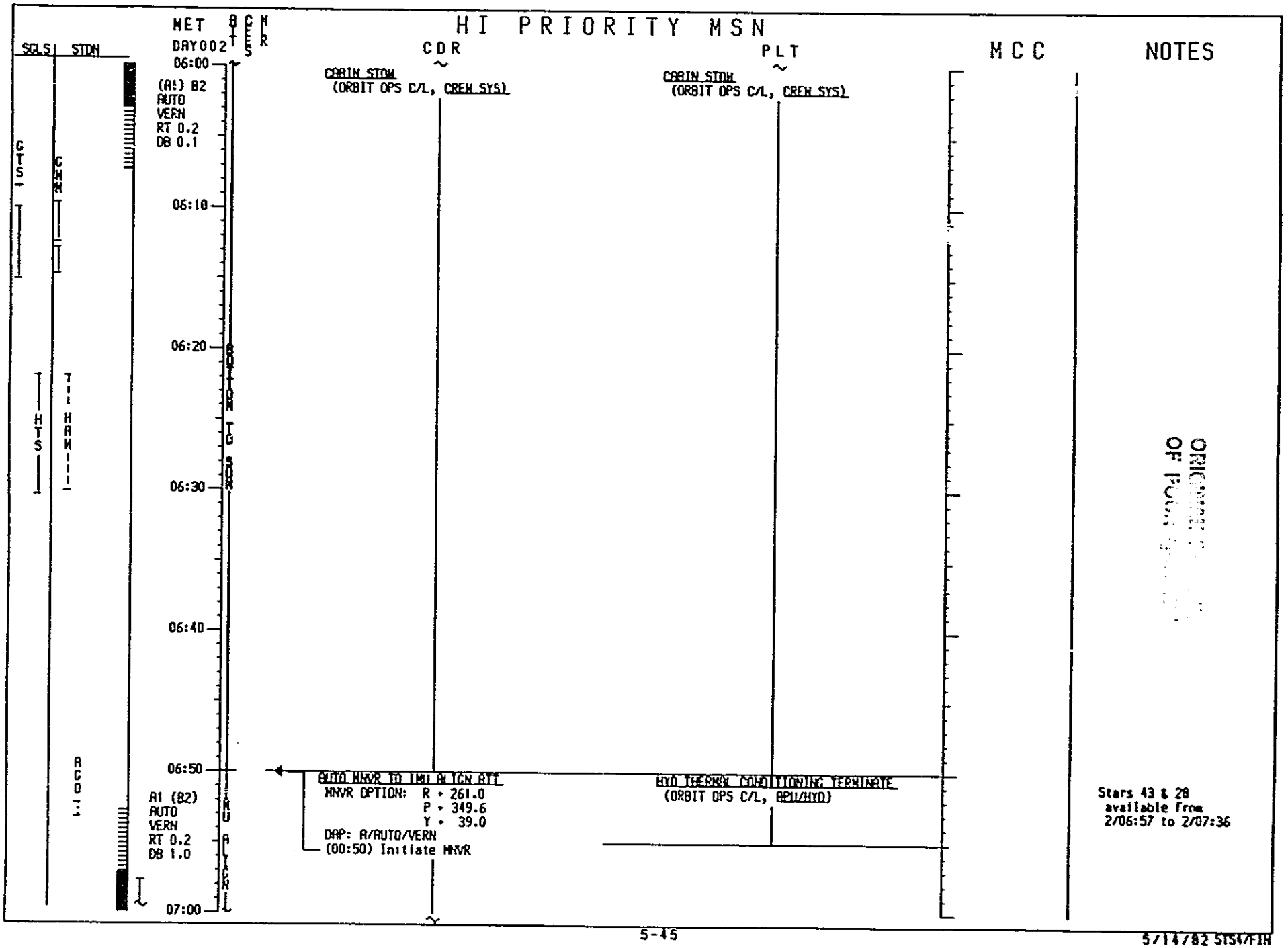
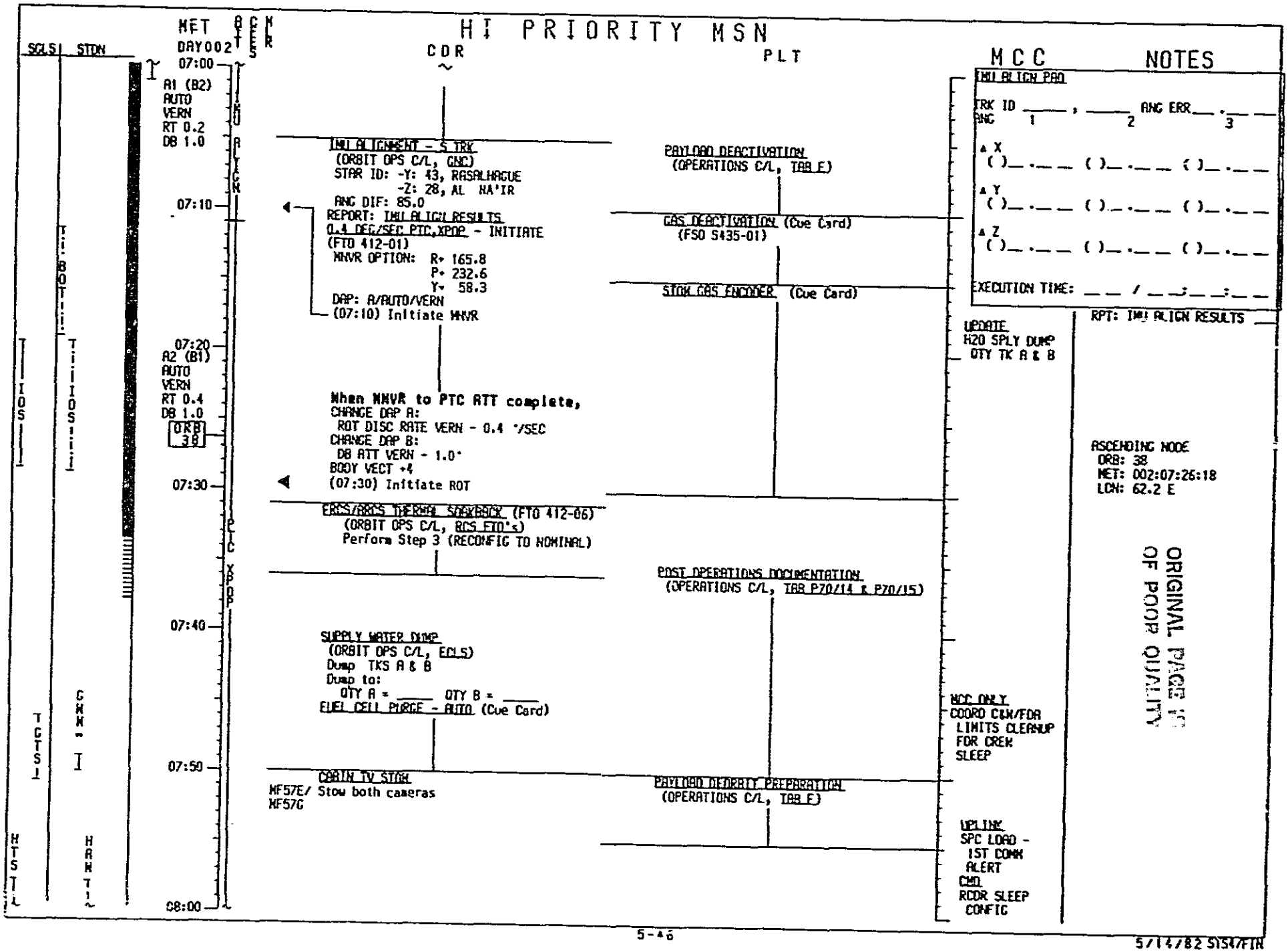

HI PRIORITY MSN
MET
DAY002
SGLS
STDN
CDR
PLT
MCC
NOTES
06:00
06:10
06:20
06:30
06:40
06:50
07:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
CABIN STOW
(ORBIT OPS C/L, CREW SYS)
AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R = 261.0
P = 349.6
Y = 39.0
DAP: A/AUTO/VERN
(00:50) Initiate MNVR
HYD THERMAL CONDITIONING TERMINATE
(ORBIT OPS C/L, APU/HYD)
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
Stars 43 & 28
available from
2/06:57 to 2/07:36
5-45
5/14/82 STS4/FIN


HI PRIORITY MSN
MET DAY002
SCLS
STDN
BCKGRS
07:00
A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0
07:10
07:20
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
ORB 38
07:30
07:40
07:50
08:00
MOTION
PTC XPDR
IOS
TGTS
GNC
HSTL
HRMT
CDR
PLT
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 43, RASALHAGUE
-Z: 28, AL NA'IR
ANG DIF: 85.0
REPORT: IMU ALIGN RESULTS
0.4 DEG/SEC PTC,XPDR - INITIATE
(FTO 412-01)
MNVR OPTION: R+ 165.8
P+ 232.6
Y+ 58.3
DAP: A/AUTO/VERN
(07:10) Initiate MNVR
When MNVR to PTC ATT complete,
CHANGE DAP A:
ROT DISC RATE VERN - 0.4 °/SEC
CHANGE DAP B:
DB ATT VERN - 1.0°
BODY VECT +4
(07:30) Initiate ROT
ERCS/RRCS THERMAL SOAKBACK (FTO 412-06)
(ORBIT OPS C/L, RCS FTO's)
Perform Step 3 (RECONFIG TO NOMINAL)
SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = ____ QTY B = ____
FUEL CELL PURGE - AUTO (Cue Card)
CABIN TV STOW
MF57E/ Stow both cameras
MF57G
PAYLOAD DEACTIVATION
(OPERATIONS C/L, TAB E)
GAS DEACTIVATION (Cue Card)
(FSO S435-01)
STOW GAS ENCLOSURE (Cue Card)
POST OPERATIONS DOCUMENTATION
(OPERATIONS C/L, TAB P70/14 & P70/15)
PAYLOAD DEORBIT PREPARATION
(OPERATIONS C/L, TAB E)
MCC
NOTES
IMU ALIGN PAD
TRK ID ____, ____ ANG ERR ___.___
ANG 1 2 3
Δ X
( )___.___ ( )___.___ ( )___.___
Δ Y
( )___.___ ( )___.___ ( )___.___
Δ Z
( )___.___ ( )___.___ ( )___.___
EXECUTION TIME: ___ / ___:___:___
UPDATE
H2O SPLY DUMP
QTY TK A & B
RPT: IMU ALIGN RESULTS
ASCENDING NODE
ORB: 38
MET: 002:07:26:18
LON: 62.2 E
MCC ONLY
COORD C&W/FDA
LIMITS CLEANUP
FOR CREW
SLEEP
UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG
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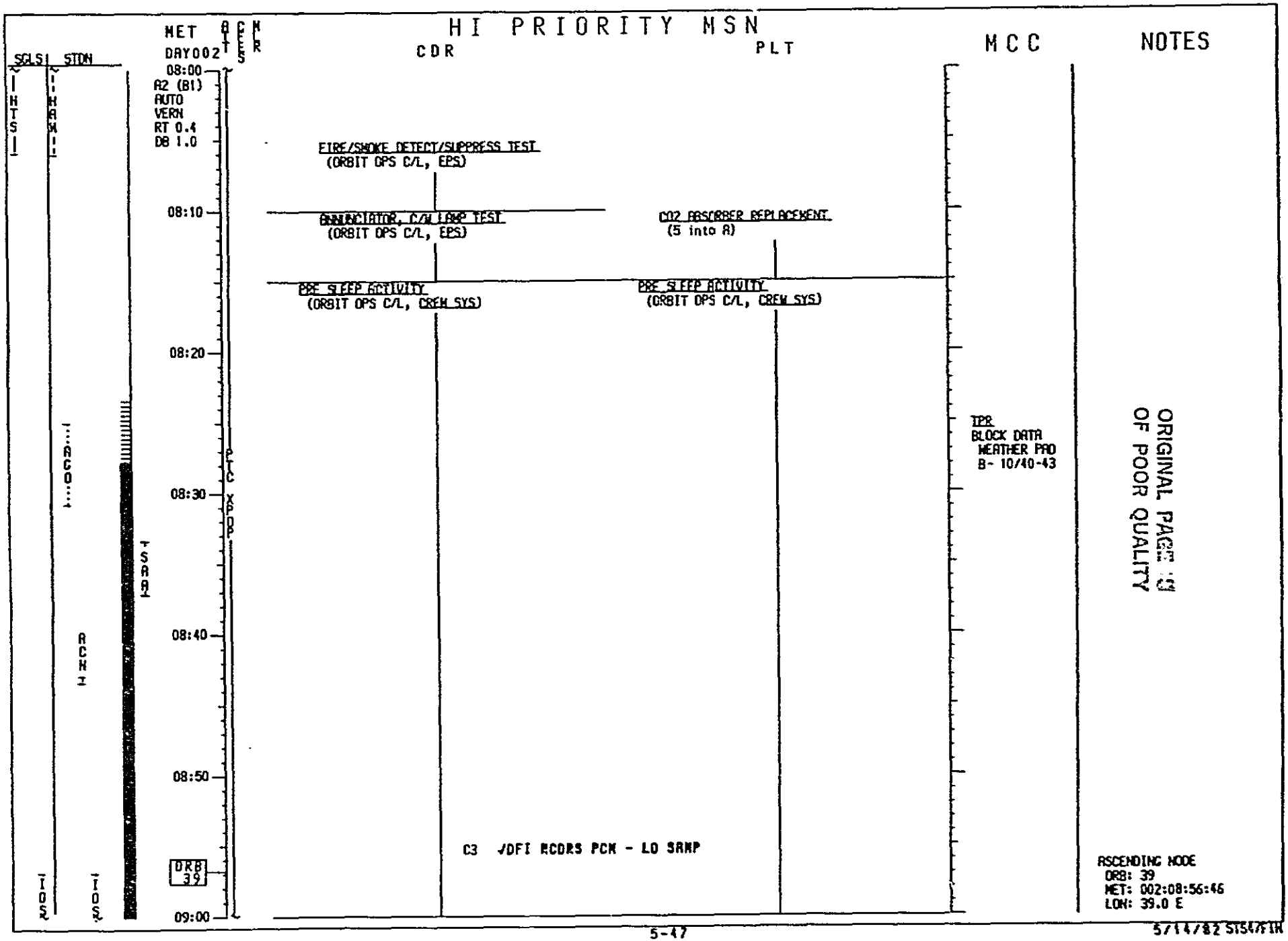
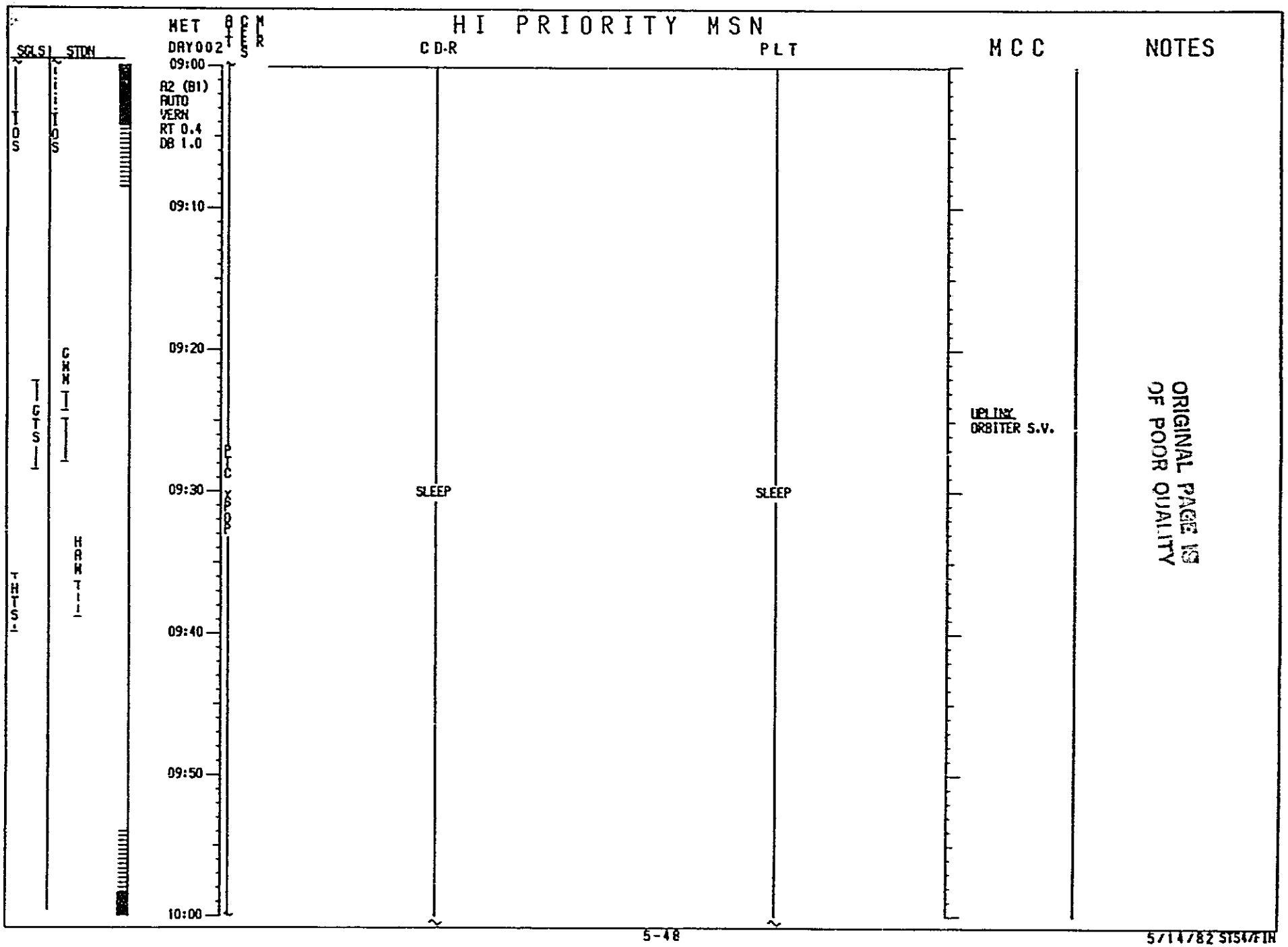
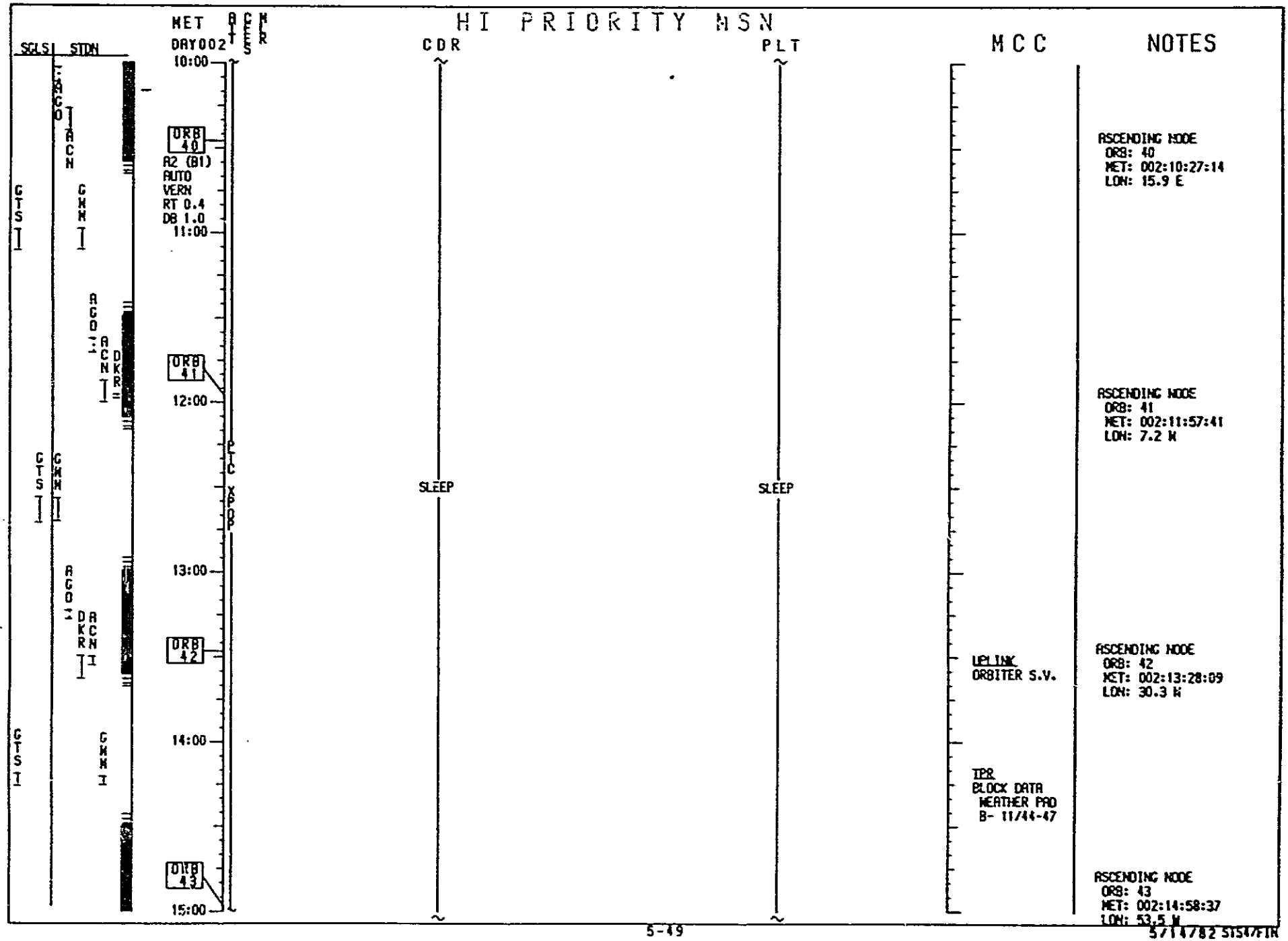
OF POOR QUALITY
5/14/82 SYS4/FIN



5/14/82 STS4/FIR



5/14/82 SISA/FIH



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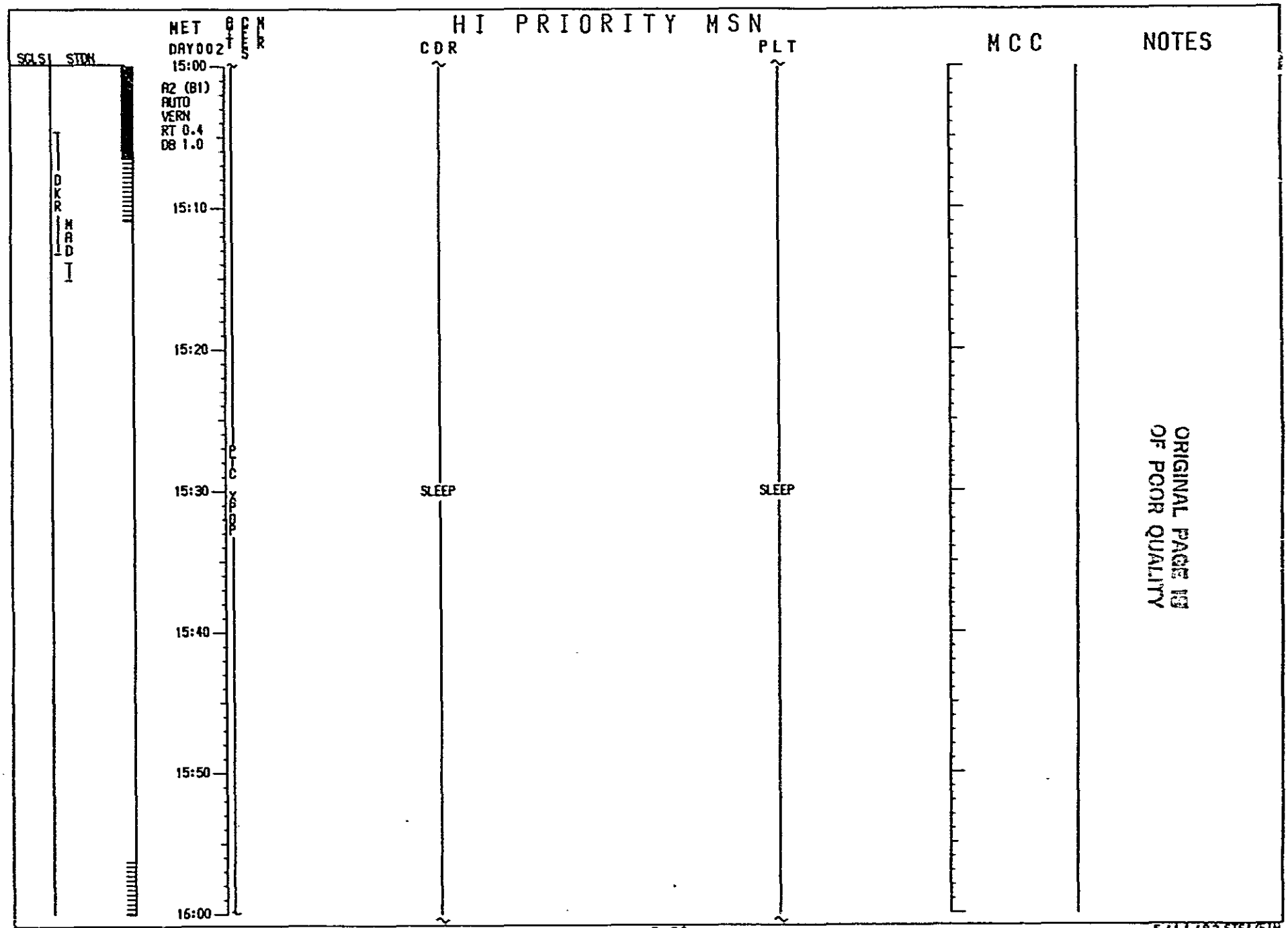
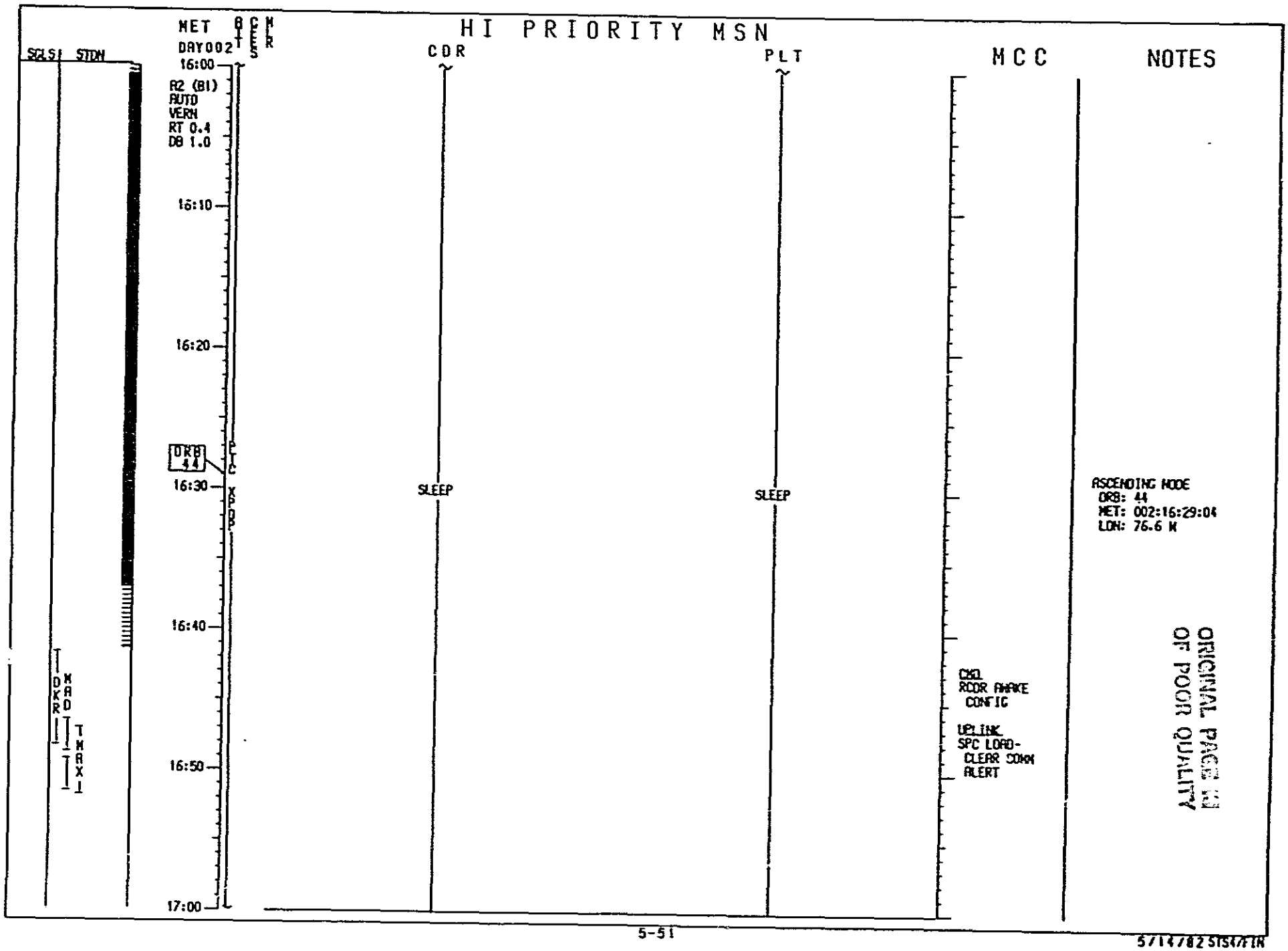


5714782 STS4/FIH



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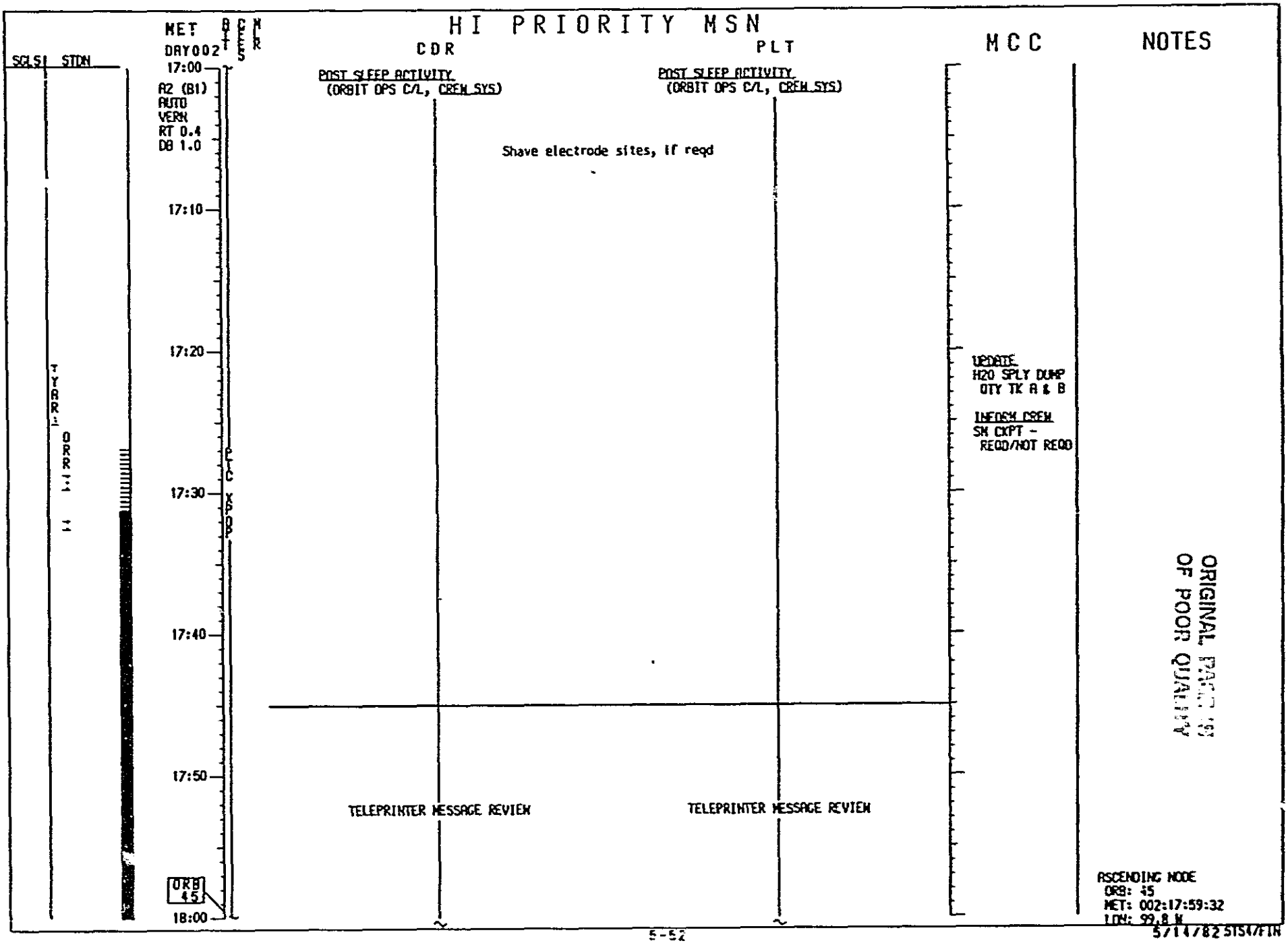
5/14/82 SISM/FIN



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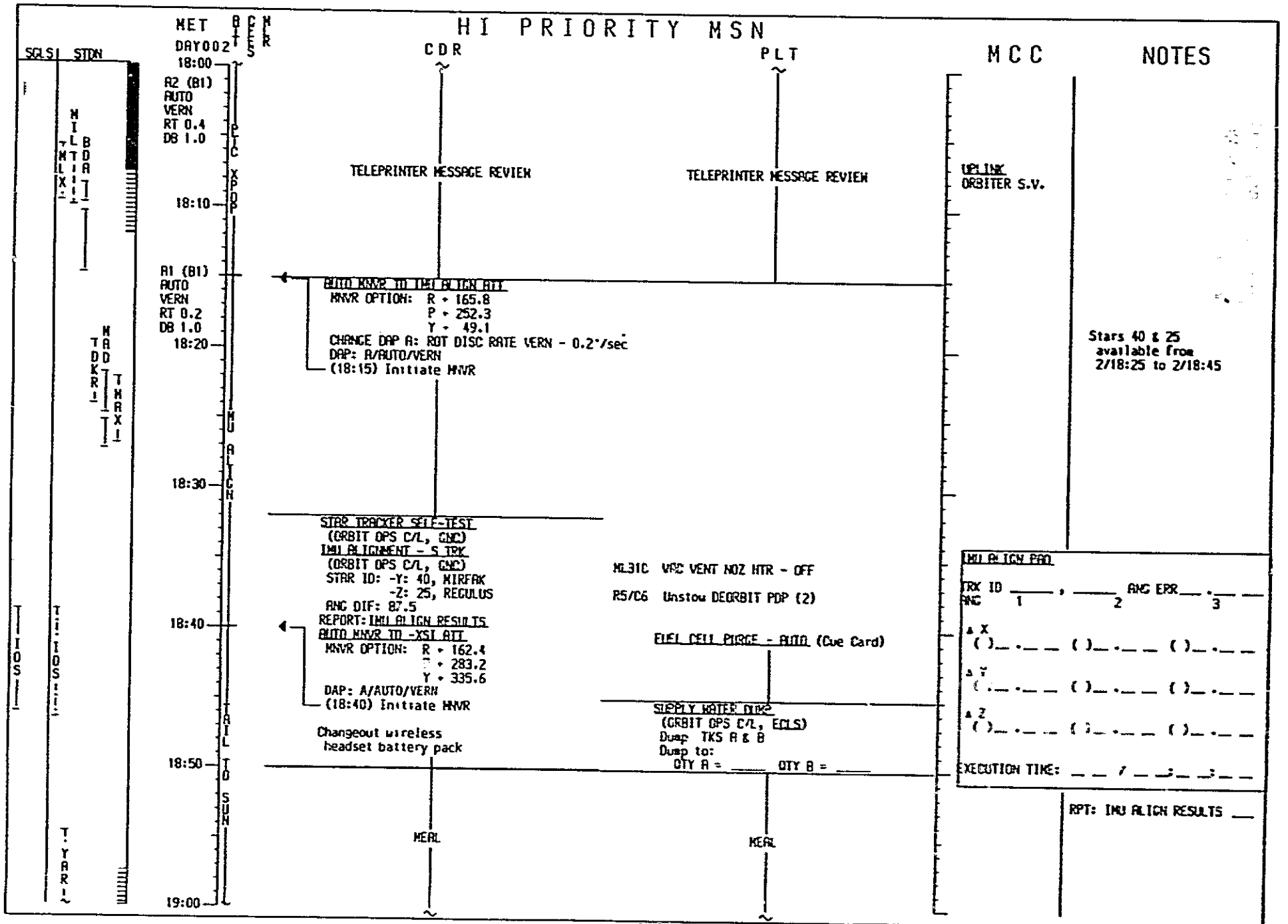
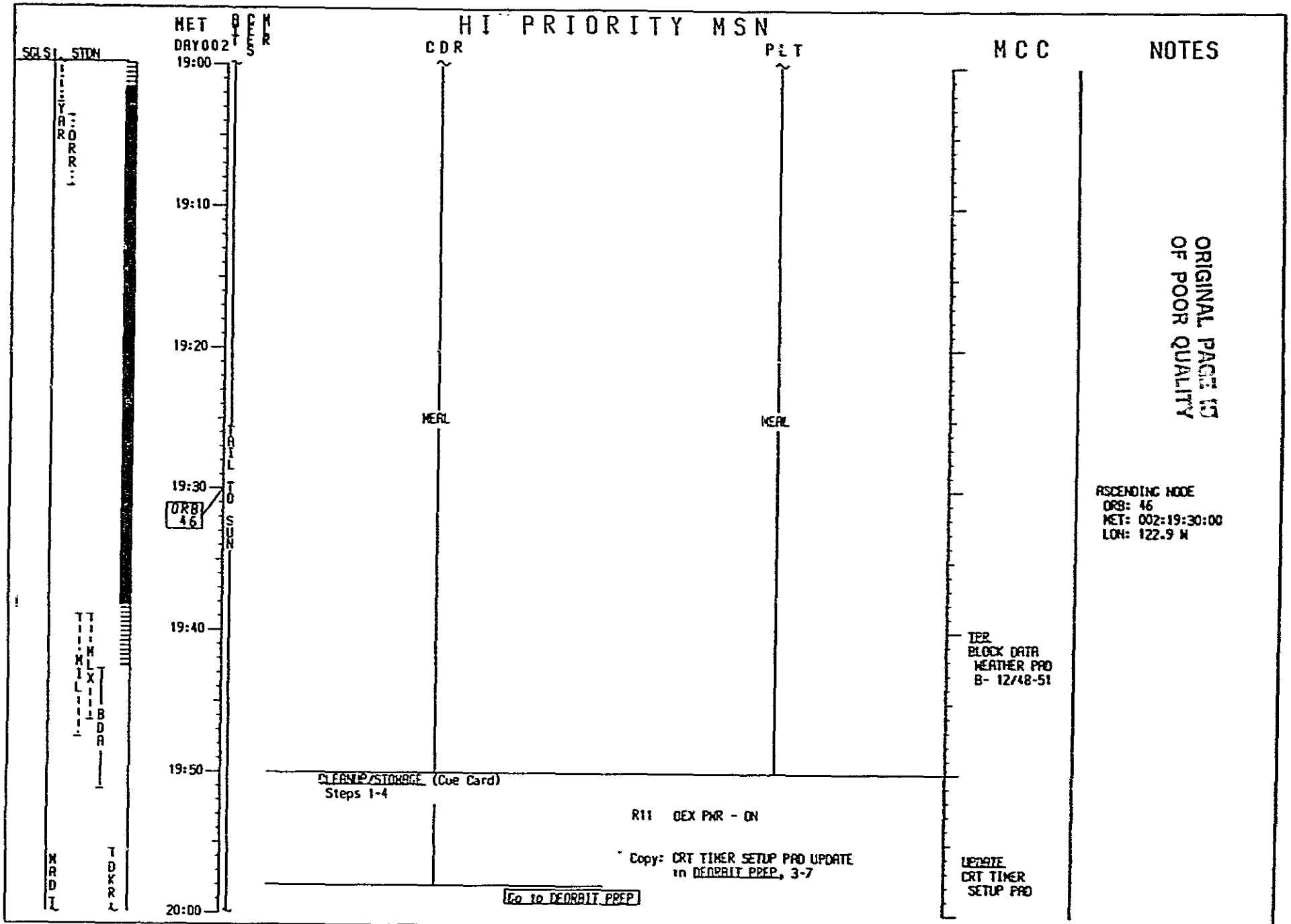


5/14/82 STS4/FIN



5/14/82 STS4/FIN

ONE-DAY EXTENSION

The STS-4 Extension Timeline is designed to follow a nominal flight up to the decision point for the 24 hour extension. This GO/NO GO decision point occurs at MET 6/00:25, prior to entry-related activities for the nominal flight.

Also, this timeline may be used after the D/O PREP BACKOUT has been executed on FD 8.

24 HOUR EXTENSION CASE:

- Execute detailed timeline pages from 6/00:00 to Deorbit Prep on FD 9
- A period of time with no scheduled activities is provided immediately following the GO/NO GO to allow preparations for the extension of the flight.

AFTER DEORBIT PREP BACKOUT CASE:

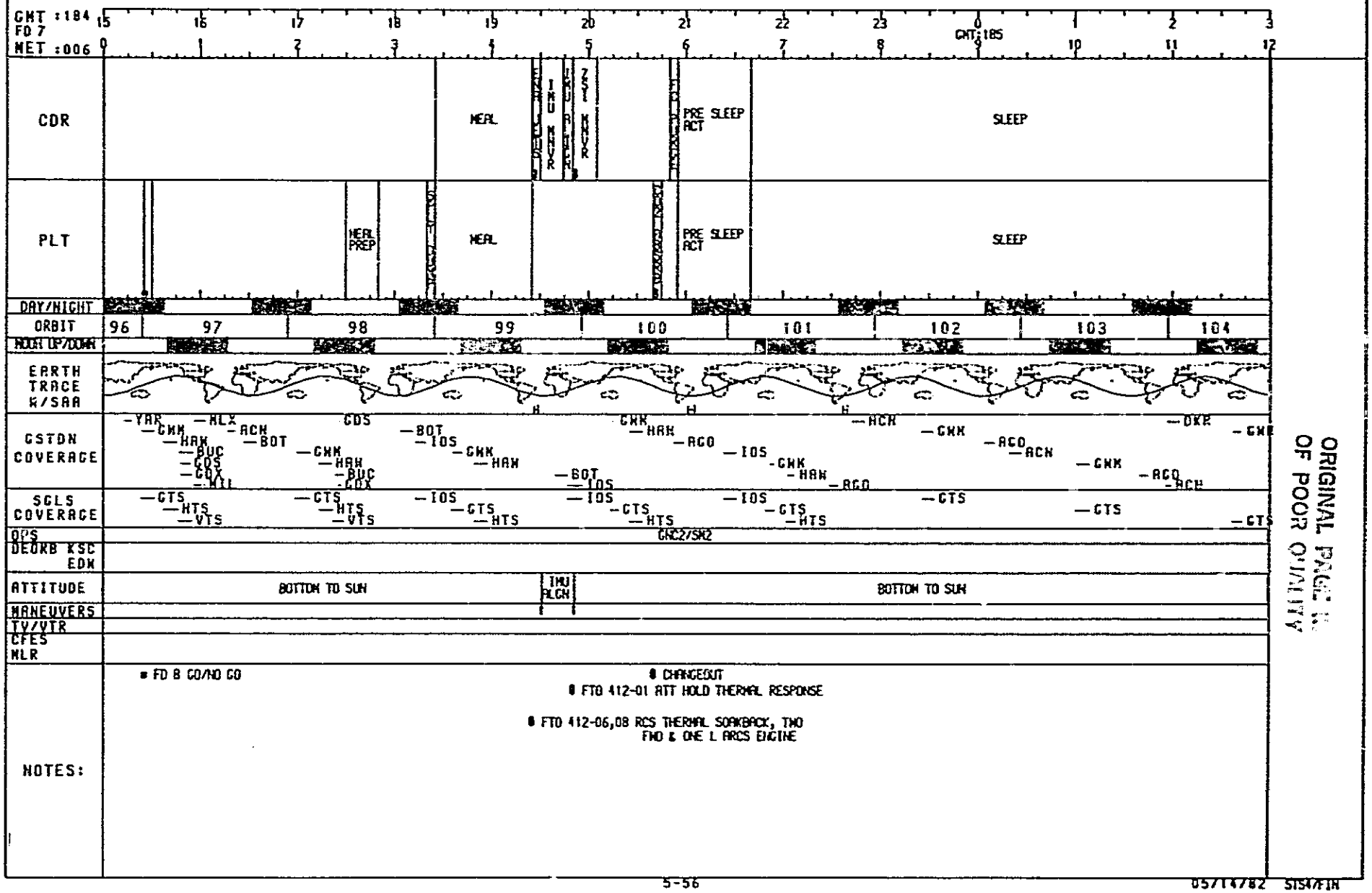
Begin timeline at 7/00:30 with the following changes:

- CDR - MCC will modify PTC to -ZLV as required (5-83); omit CABIN TV STOW at 7/04:15 MET
- PLT - Omit all activities between MET 7/02:10 and 7/04:20 (i.e., P/L DEACT, CABIN STOW, CO_2 ABSORBER REPLACEMENT)

ONE-DAY EXTENSION

ONE-DAY EXTENSION

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	NOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
184:15:00/ 185:03:00	006:00:00/ 006:12:00	184:10:00/ 184:22:00	7/ 184 CDT	16.3		JULY 3, 1982	STS-4	FINAL	05/14/82



NOTES:

- FD 8 GO/NO GO
- CHANGEOUT
- FTO 412-01 ATT HOLD THERMAL RESPONSE
- FTO 412-06,08 RCS THERMAL SOAKBACK, TWO FWD & ONE L AFCS ENGINE

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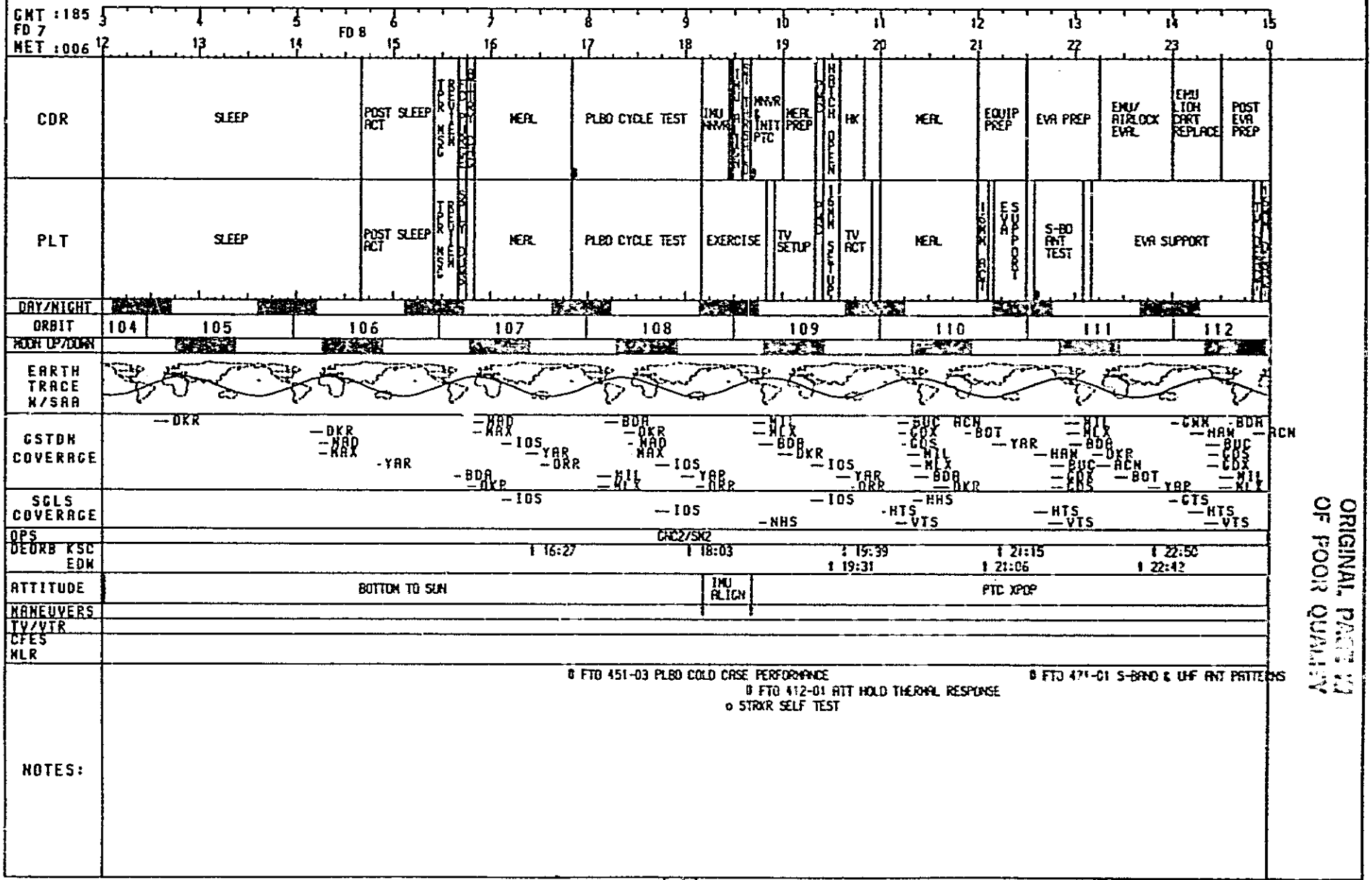
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	NOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
185:03:00/ 185:15:00	006:12:00/ 007:00:00	184:22:00/ 185:10:00	7/ 184 CDT	18.8		JULY 4, 1982	STS-4	FINAL	05/14/82



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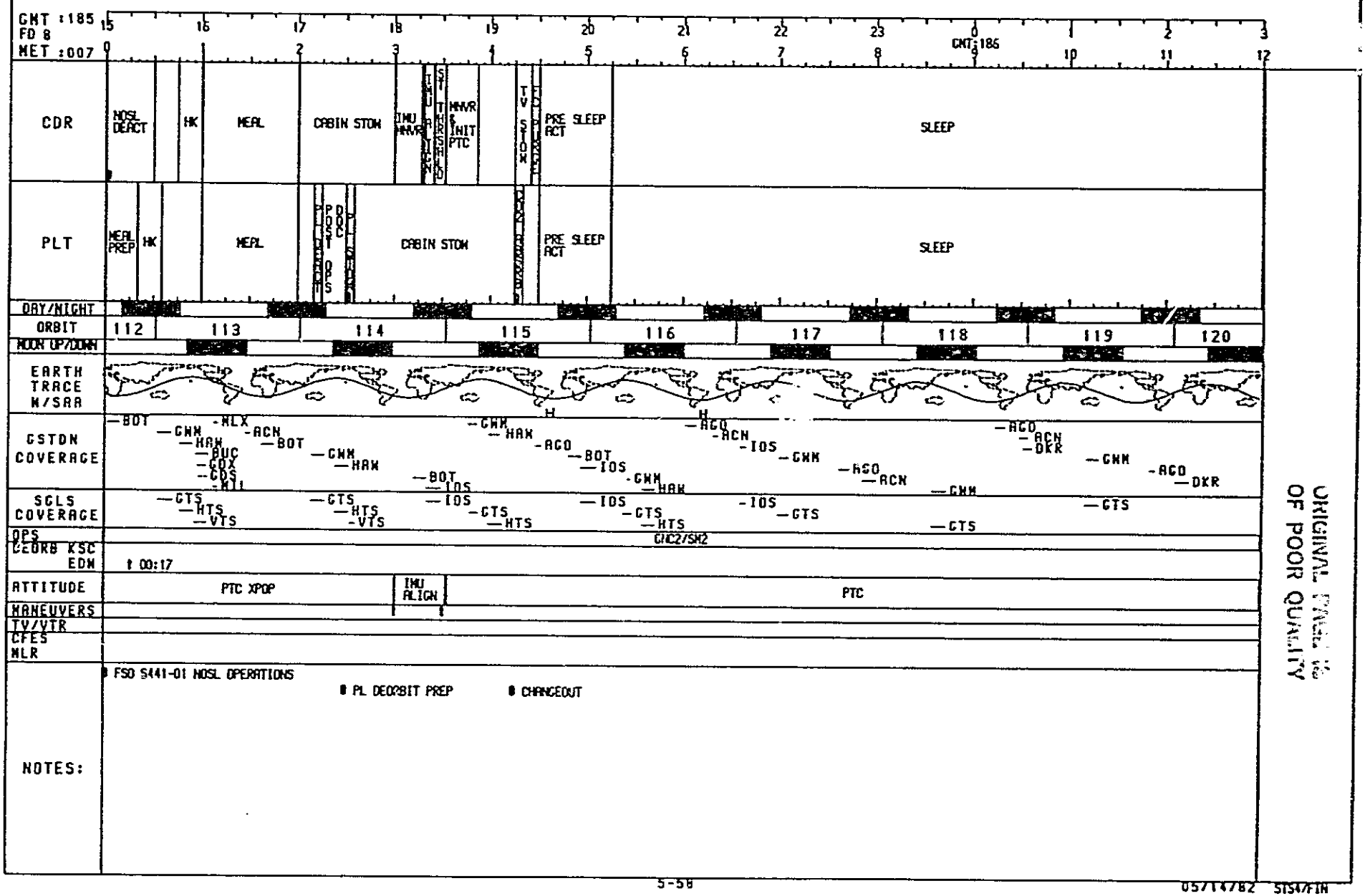
185:15:00/ 186:03:00	007:00:00/ 007:12:00	185:10:00/ 185:22:00	/ 185 CDT	20.7	○	JULY 4, 1982	STS-4	FINAL	05/14/82



NOTES:

- FSO S441-01 NOSL OPERATIONS
- PL DEORBIT PREP
- CHANGEOUT

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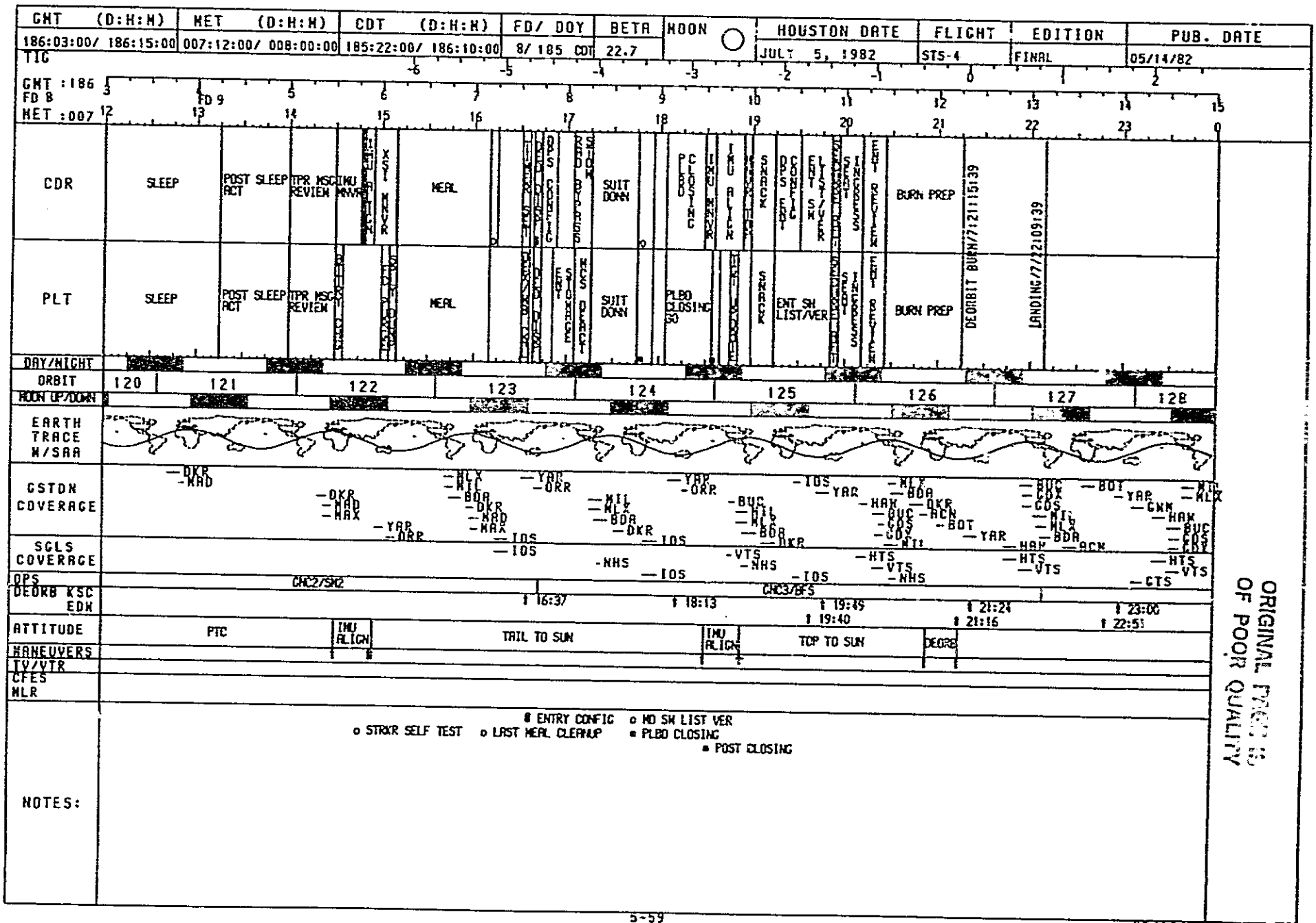
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
186:03:00/ 186:15:00	007:12:00/ 008:00:00	185:22:00/ 186:10:00	8/ 185 CDT	22.7	○	JULY 5, 1982	STS-4	FINAL	05/14/82



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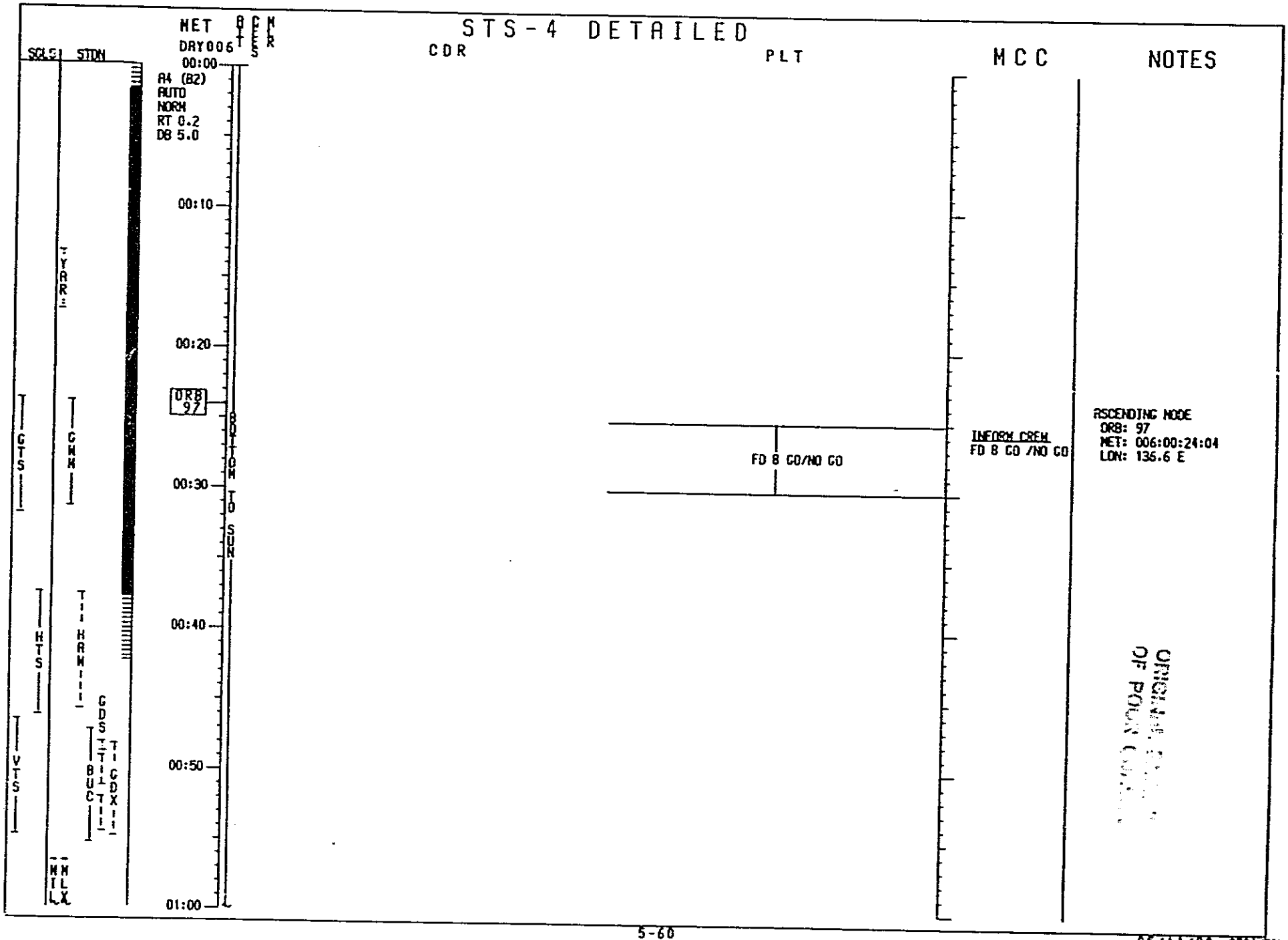

05/14/82 STS4/F1H

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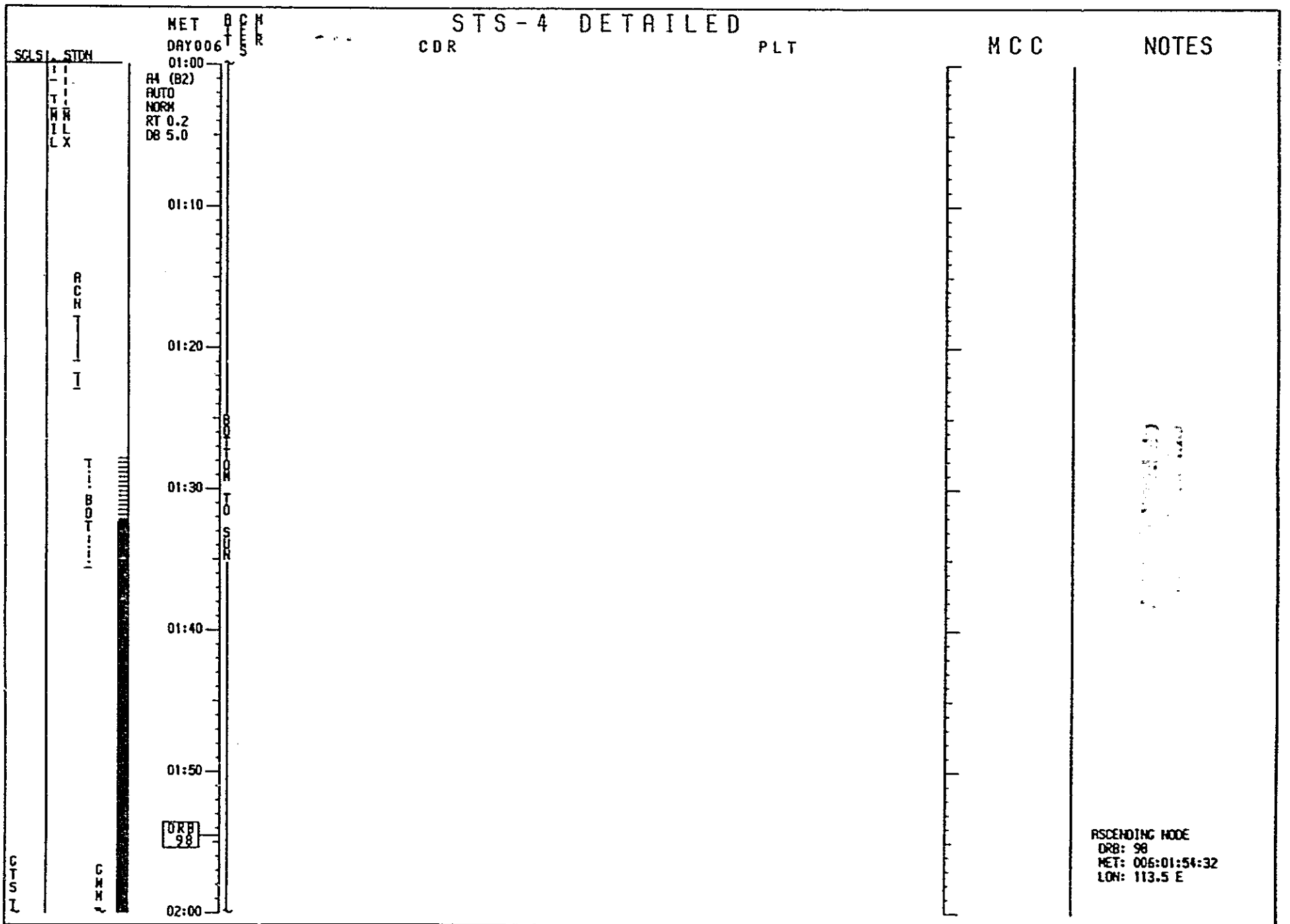
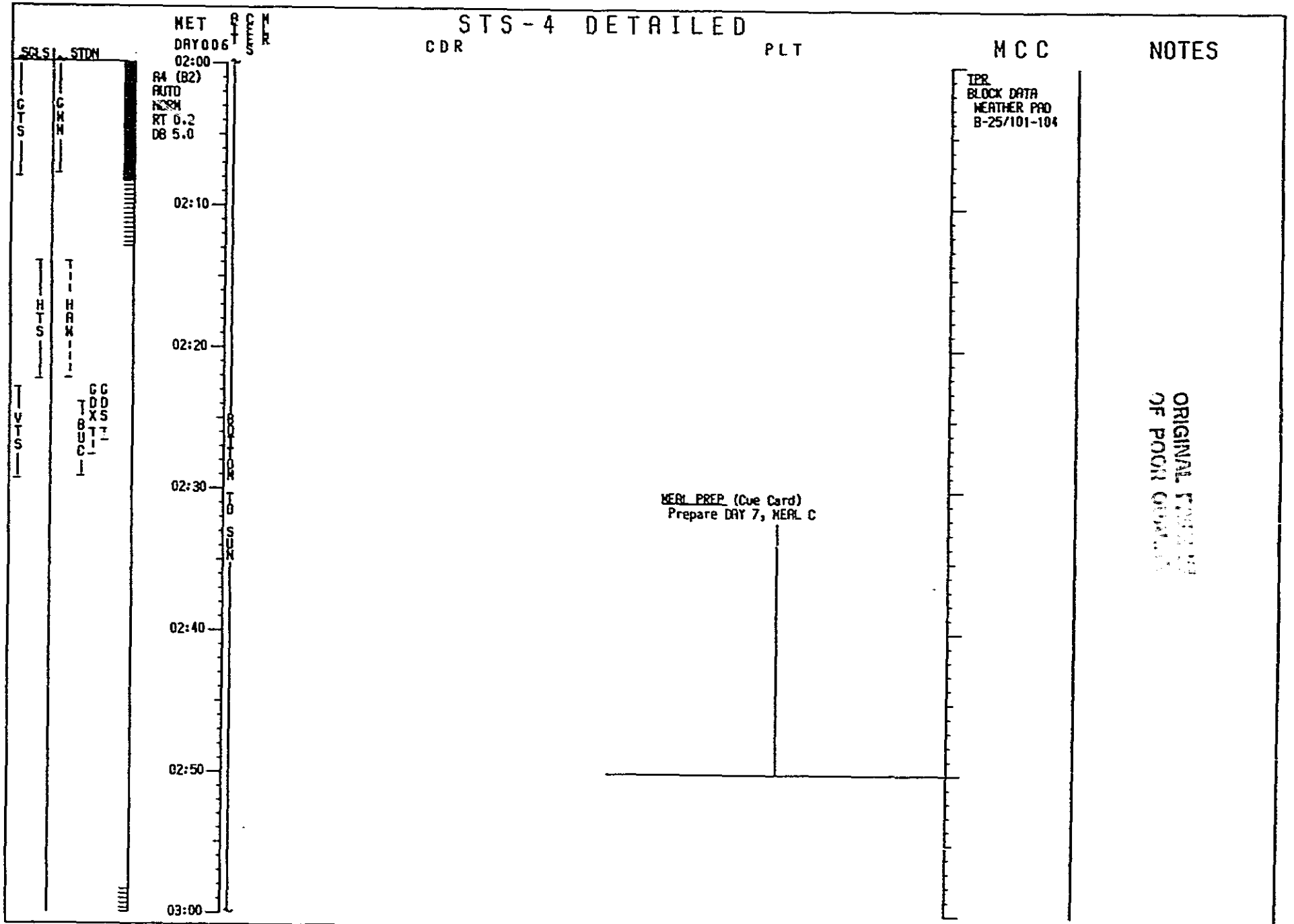


05/14/82 SIS4/FIN

STS-4 DETAILED



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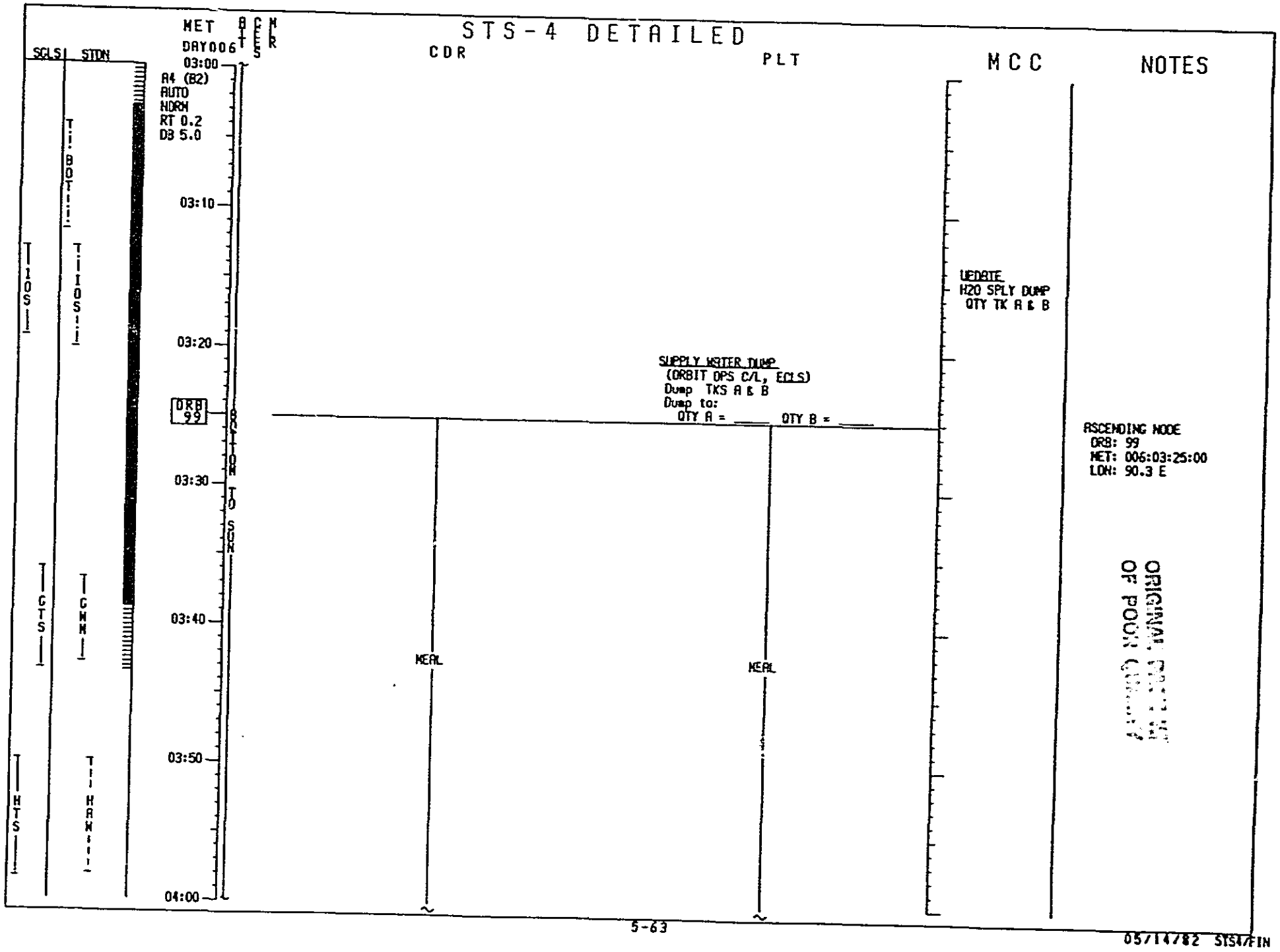
05/14/82 STS4/FIN



05/14/82 STS4/FIN

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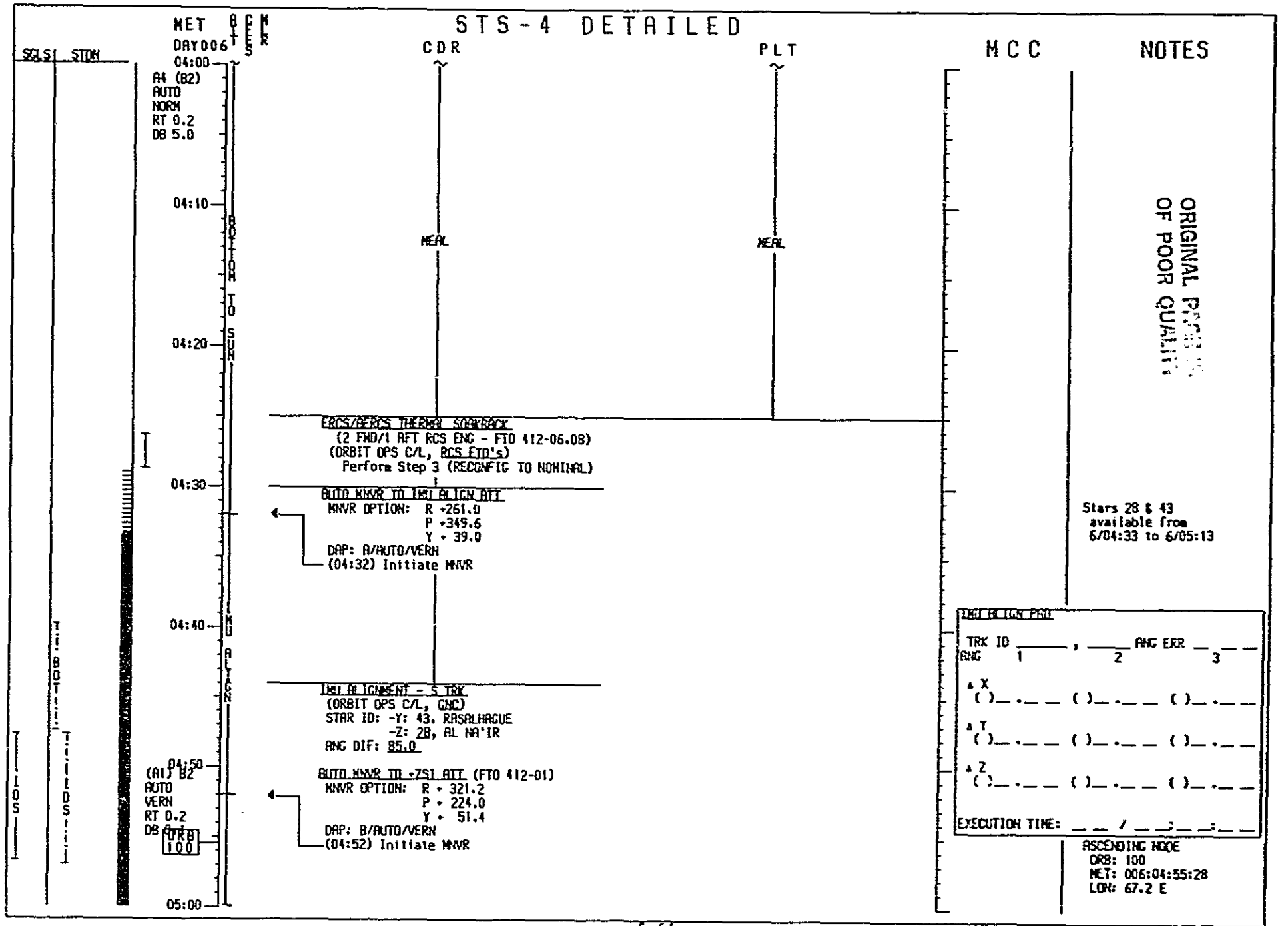

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05714782 STS4-FIN

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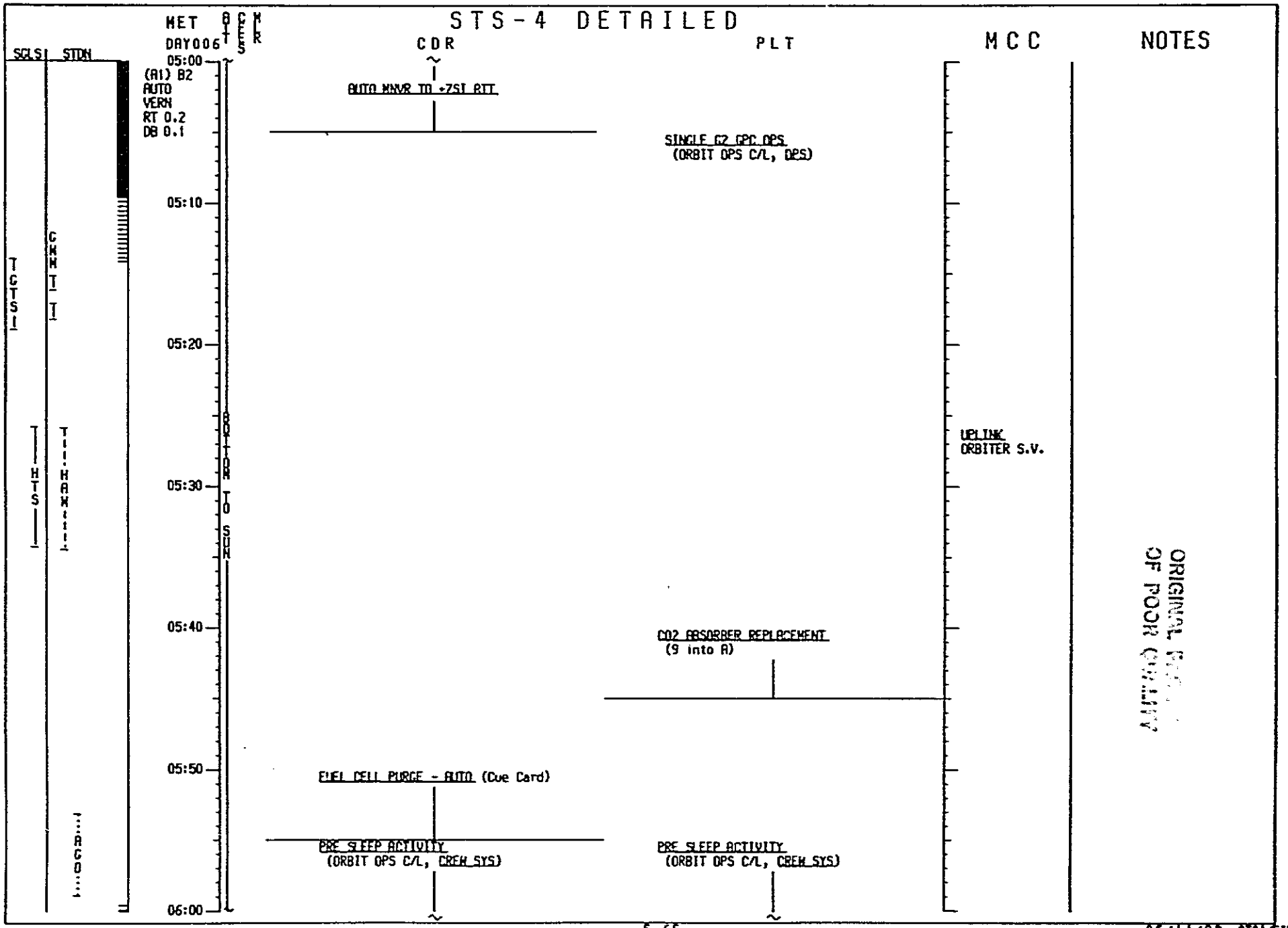

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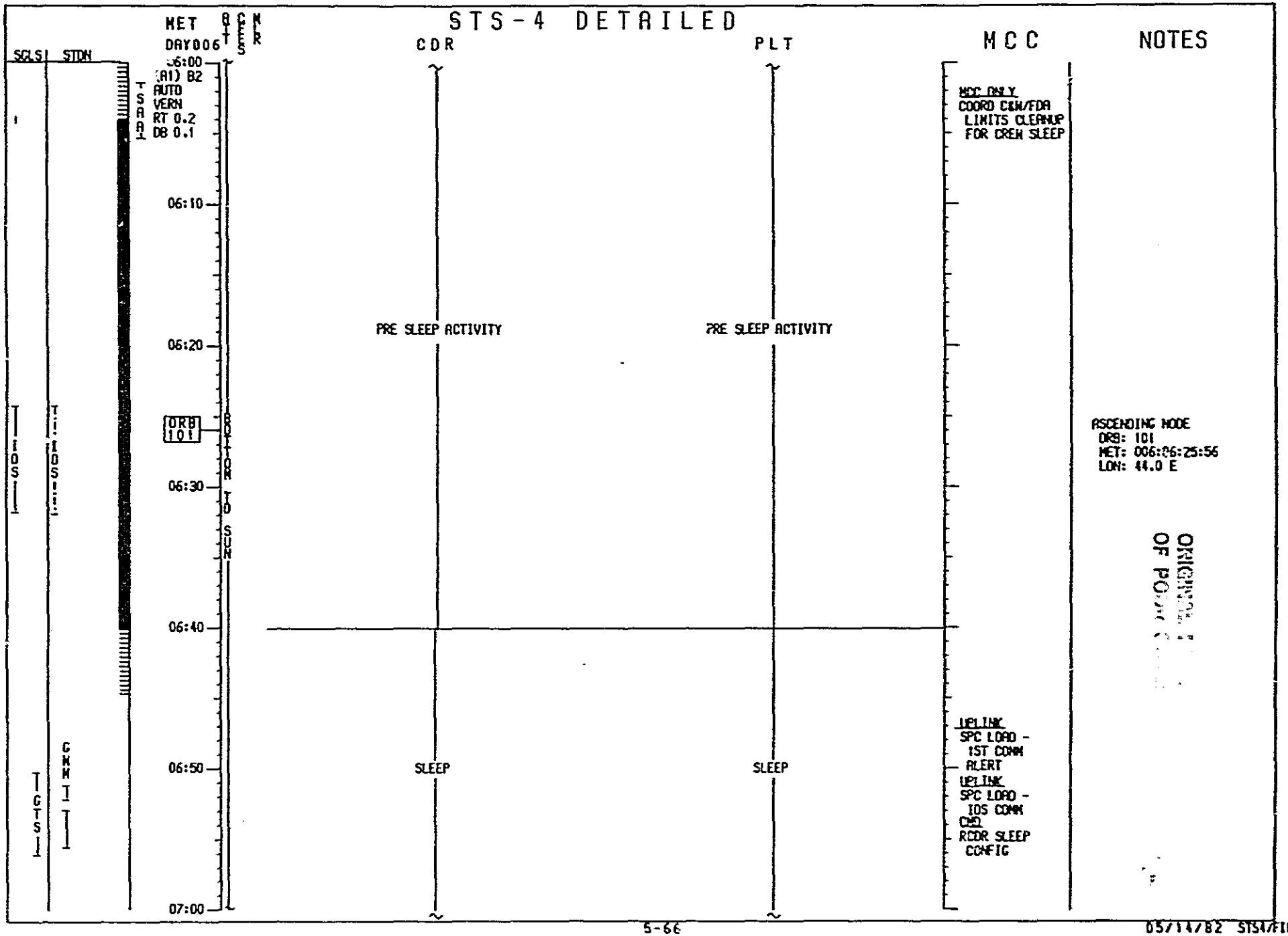
05/14/82 STS4FIH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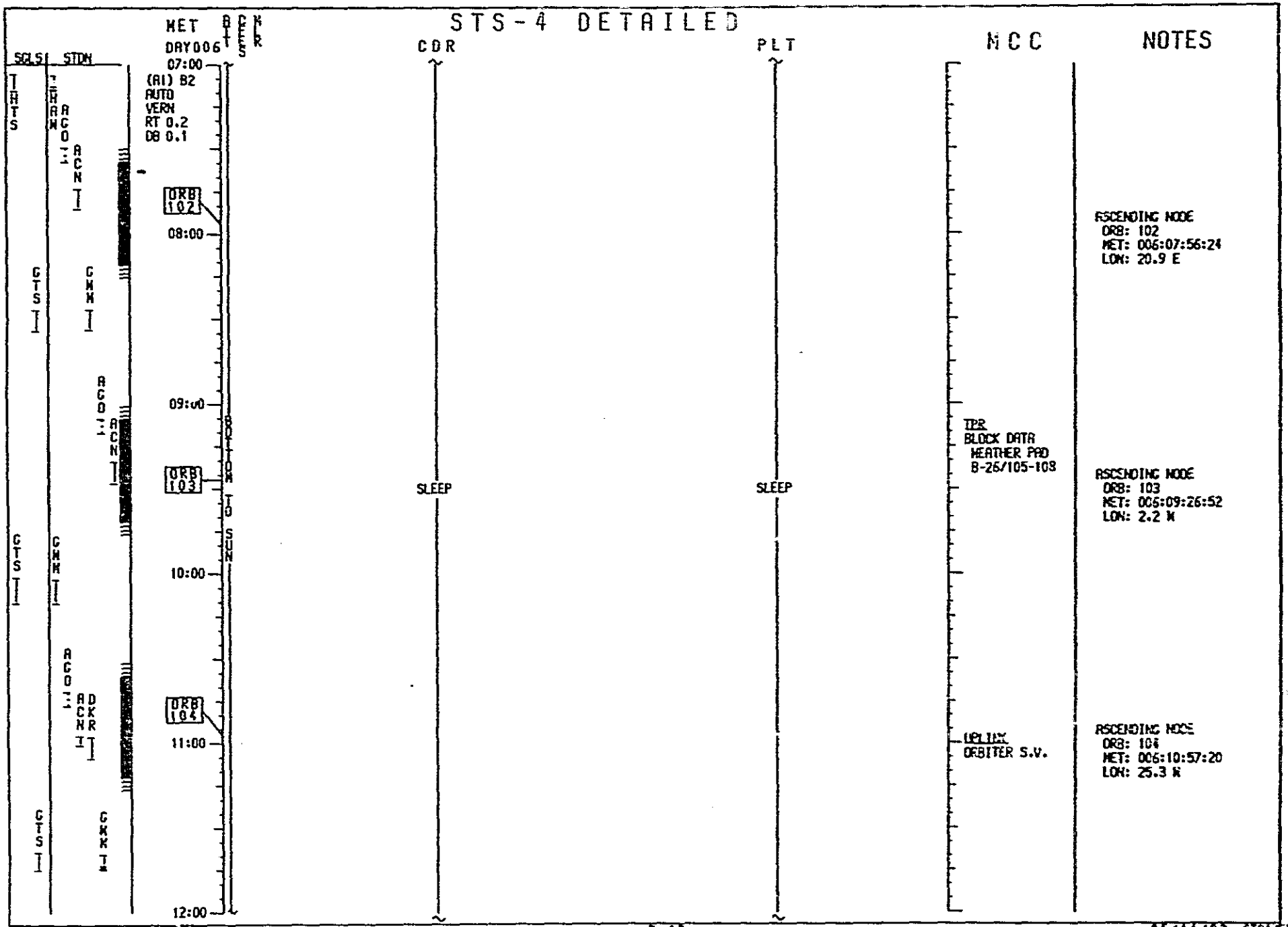
MET
DAY006
SGLS
STDN
TDRS
GNTI
GTS
TSAA
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
06:00
06:10
06:20
06:30
06:40
06:50
07:00
ORB
101
ROTATION TO SCN
CDR
PLT
PRE SLEEP ACTIVITY
PRE SLEEP ACTIVITY
SLEEP
SLEEP
MCC
MCC ONLY
COORD C&W/FDA
LIMITS CLEANUP
FOR CREW SLEEP
UPLINK
SPC LOAD -
1ST COMM
ALERT
UPLINK
SPC LOAD -
IOS COMM
CMD
RCDR SLEEP
CONFIG
NOTES
ASCENDING NODE
ORB: 101
MET: 006:06:25:56
LON: 44.0 E
5-66
05/14/82 STS4/FIN



05714782 STS4FIN

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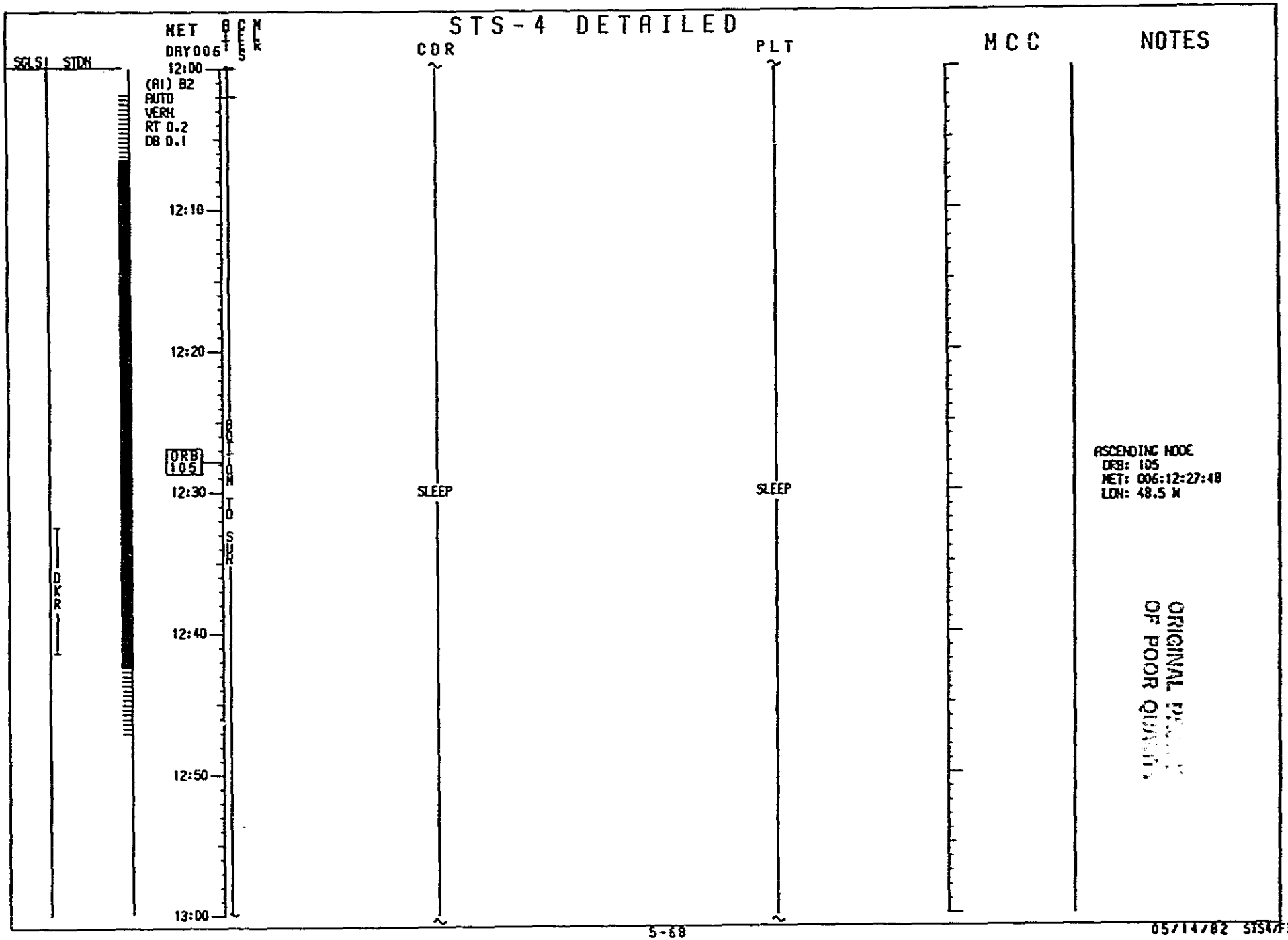

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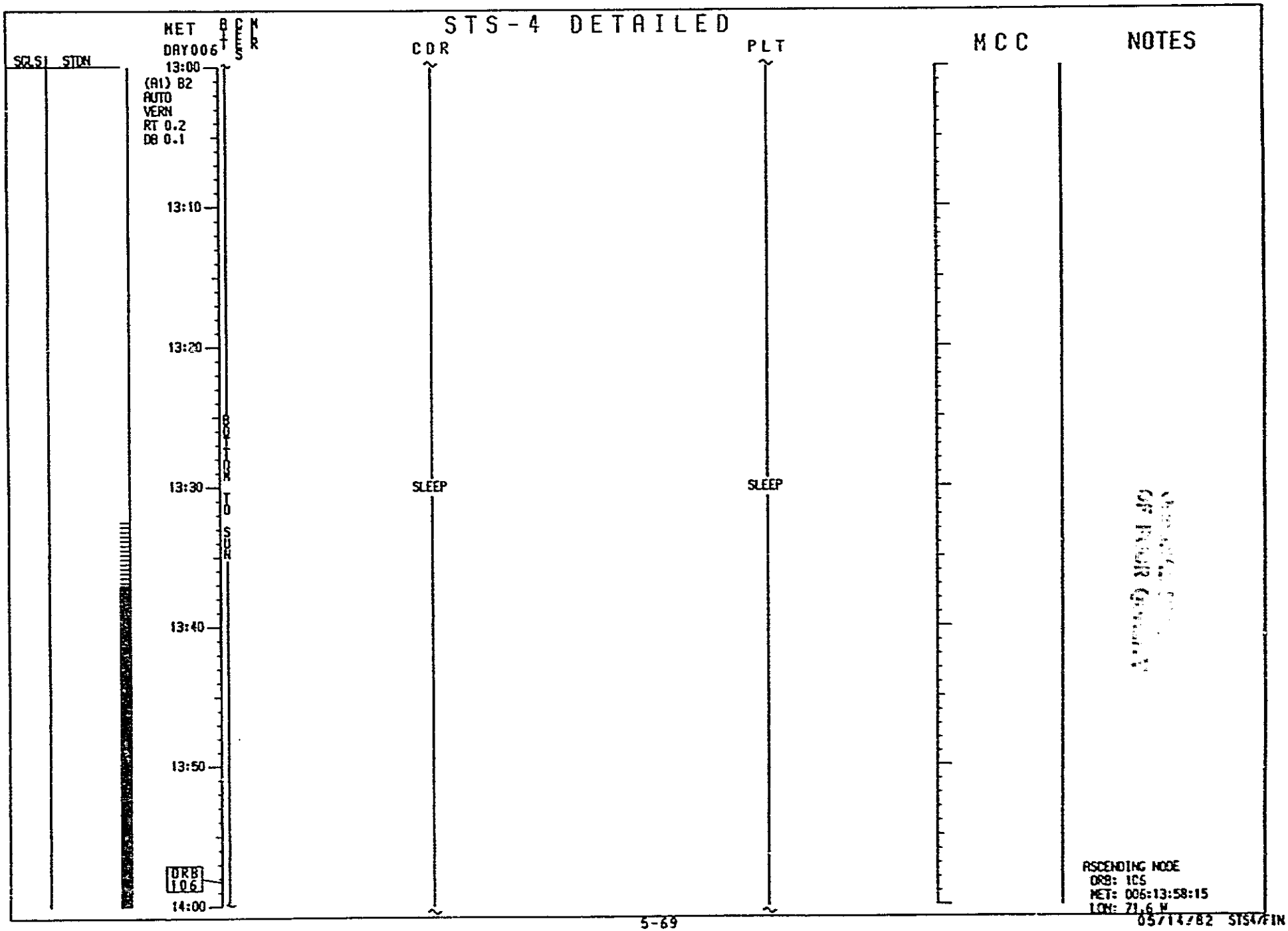
05/14782 STS4FIN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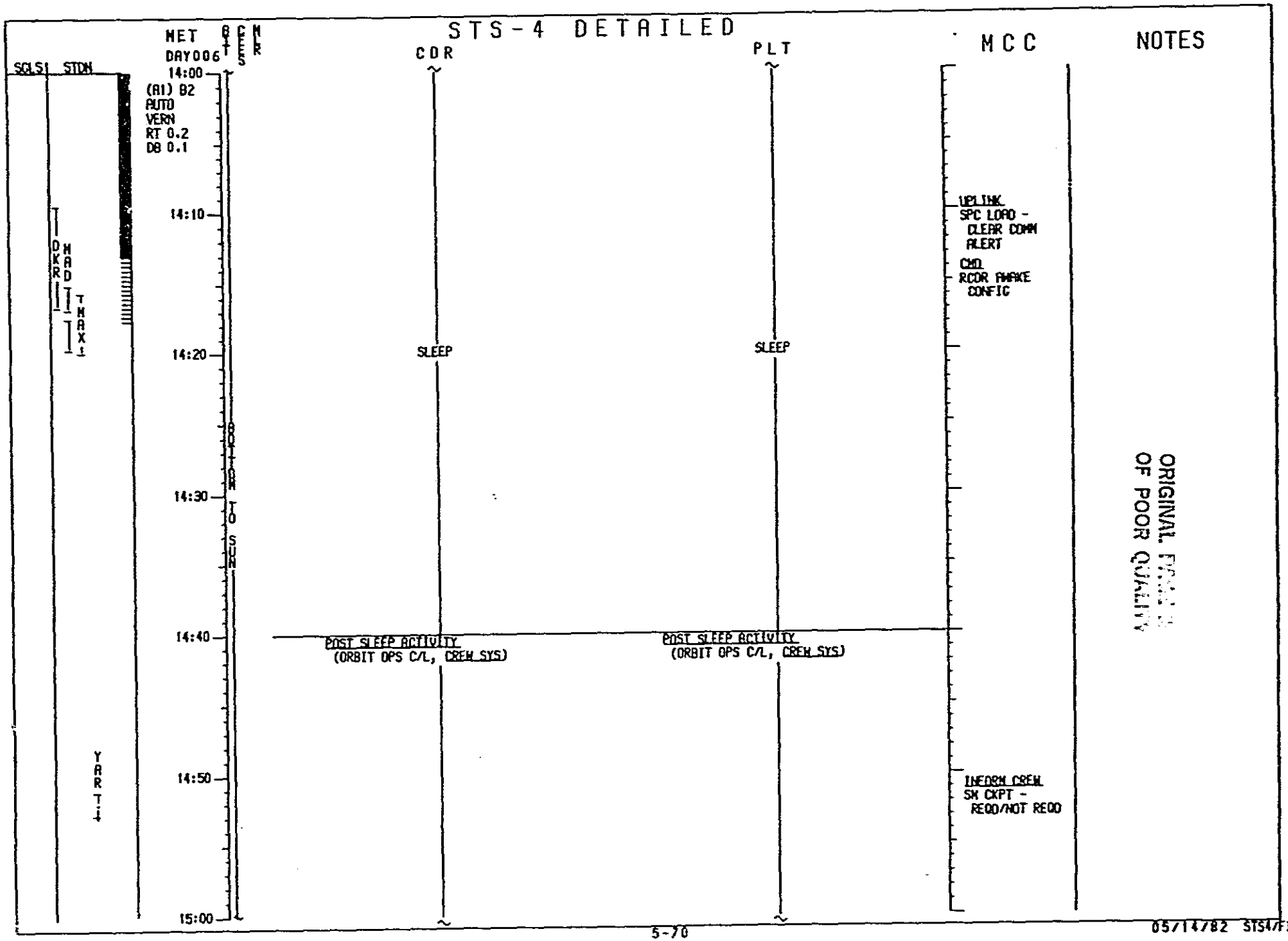
DAY006
SRSS
STDN
BCMR TEES
13:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
13:10
13:20
13:30
13:40
13:50
ORB 106
14:00
CDR
SLEEP
PLT
SLEEP
MCC
NOTES
ASCENDING NODE
ORB: 106
MET: 006:13:58:15
LON: 71.6 W
05/14/82 STS4FIN


STS-4 DETAILED
MET
DAY006
SCLS
STDN
DKR
HAD
TMAX
YAR
14:00
14:10
14:20
14:30
14:40
14:50
15:00
(A1) B2
AUTO
VERN
RT 0.2
DB 0.1
ROTATION TO SCH
CDR
PLT
SLEEP
SLEEP
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)
MCC
NOTES
UPLINK
SPC LOAD -
CLEAR COMM
ALERT
CMD
RCDR AWAKE
CONFIG
INFORM CREW
SM CKPT -
REQD/NOT REQD
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05/14/82 STS4/FIN

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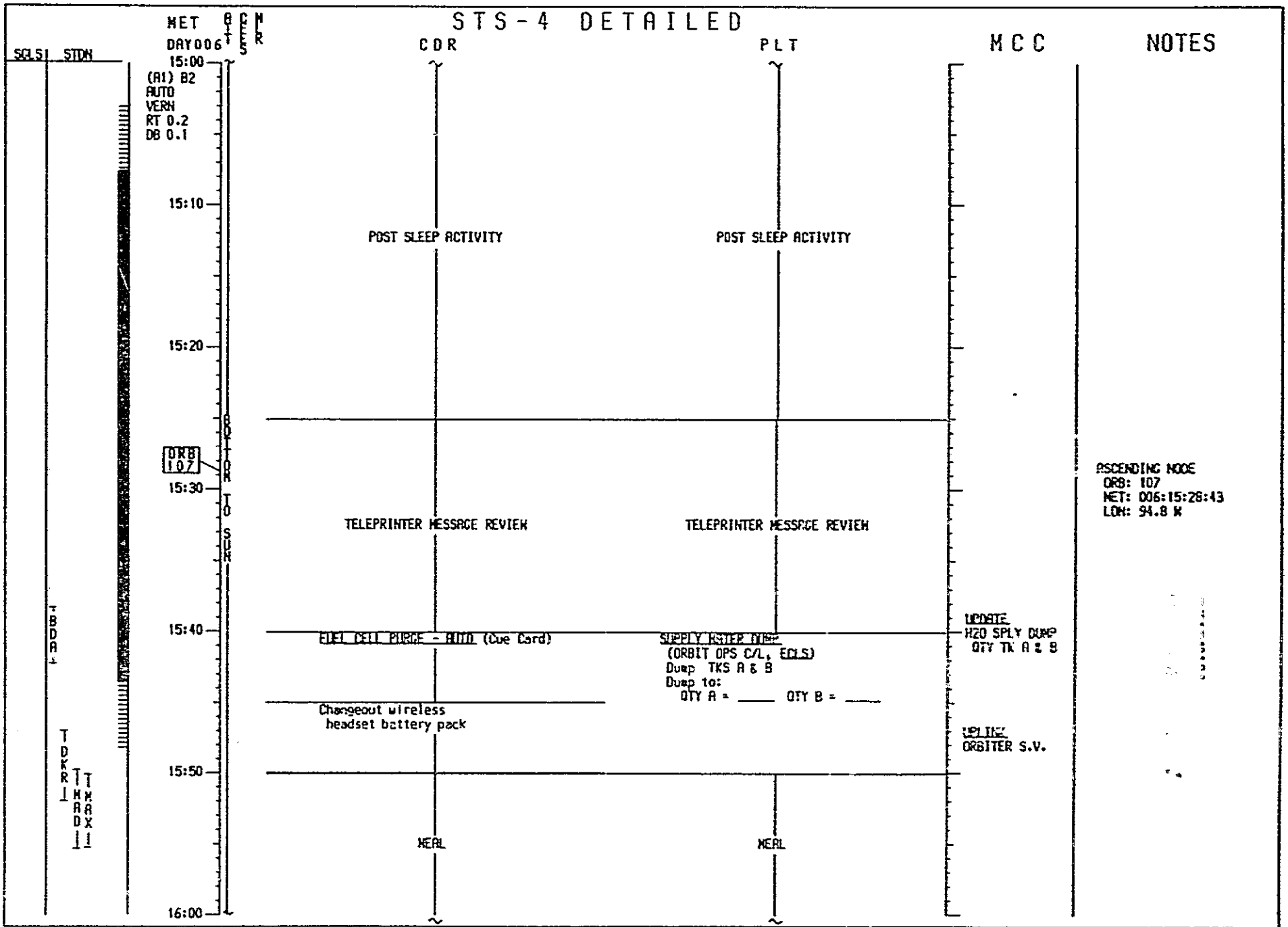

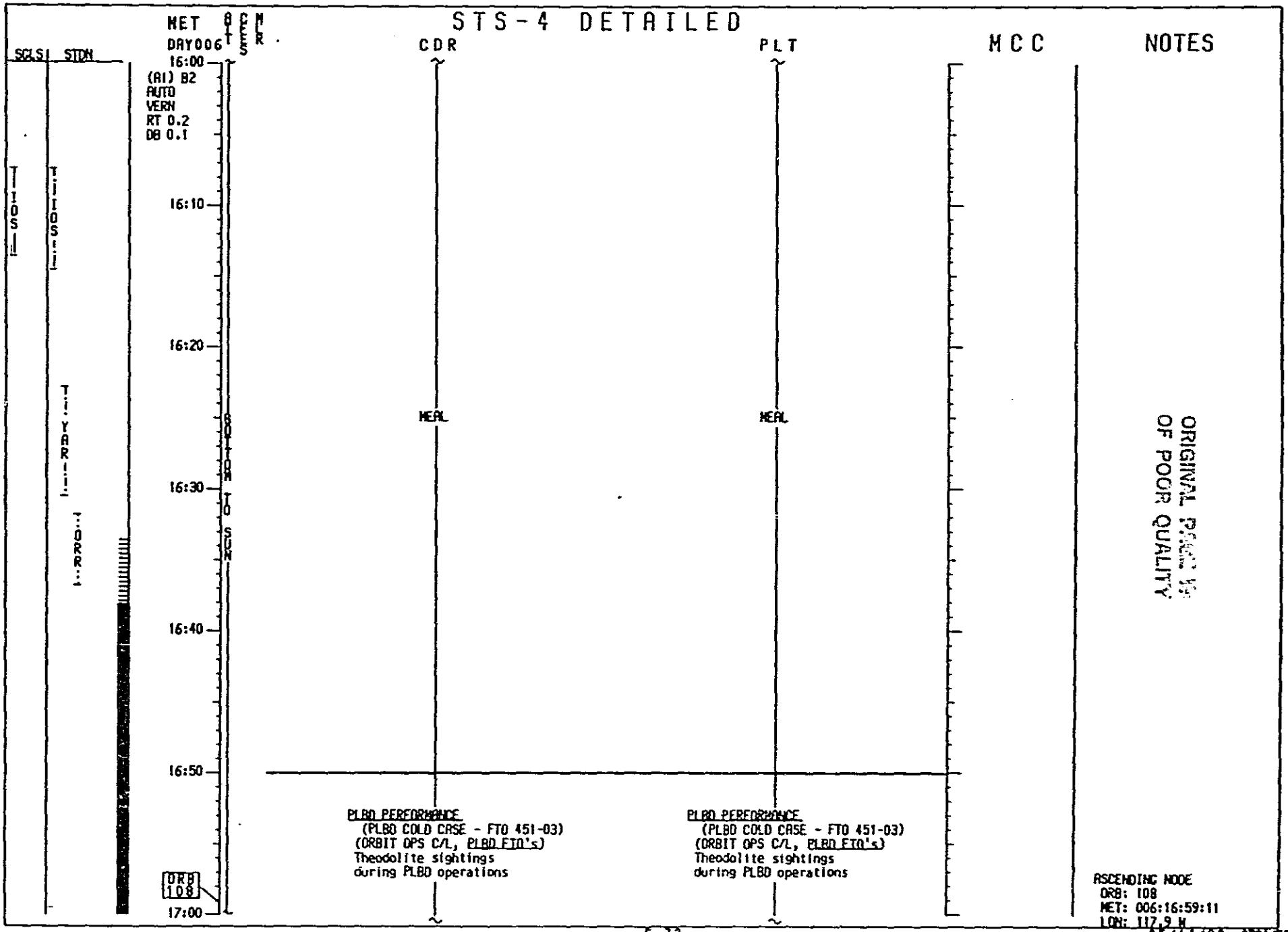

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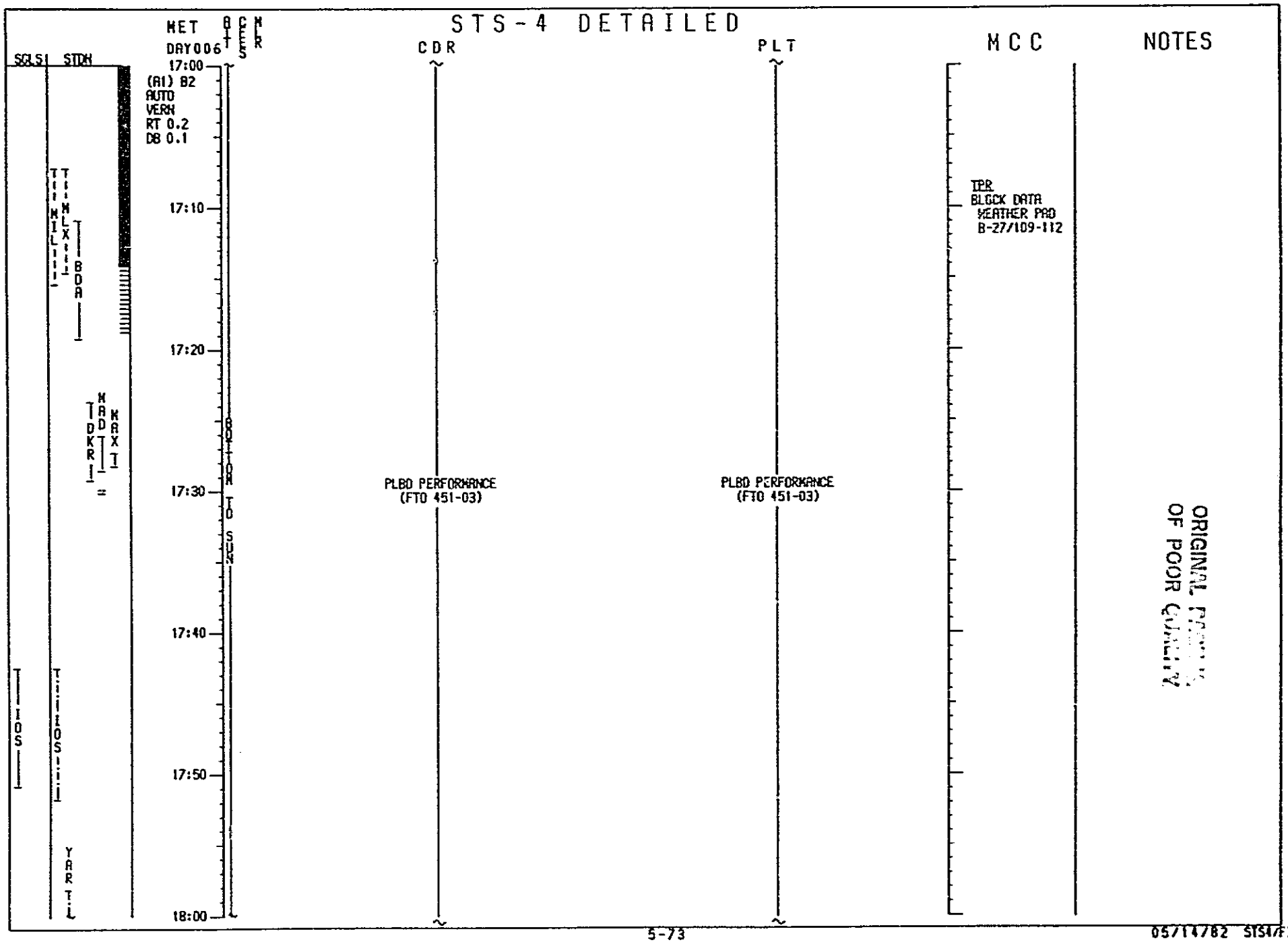

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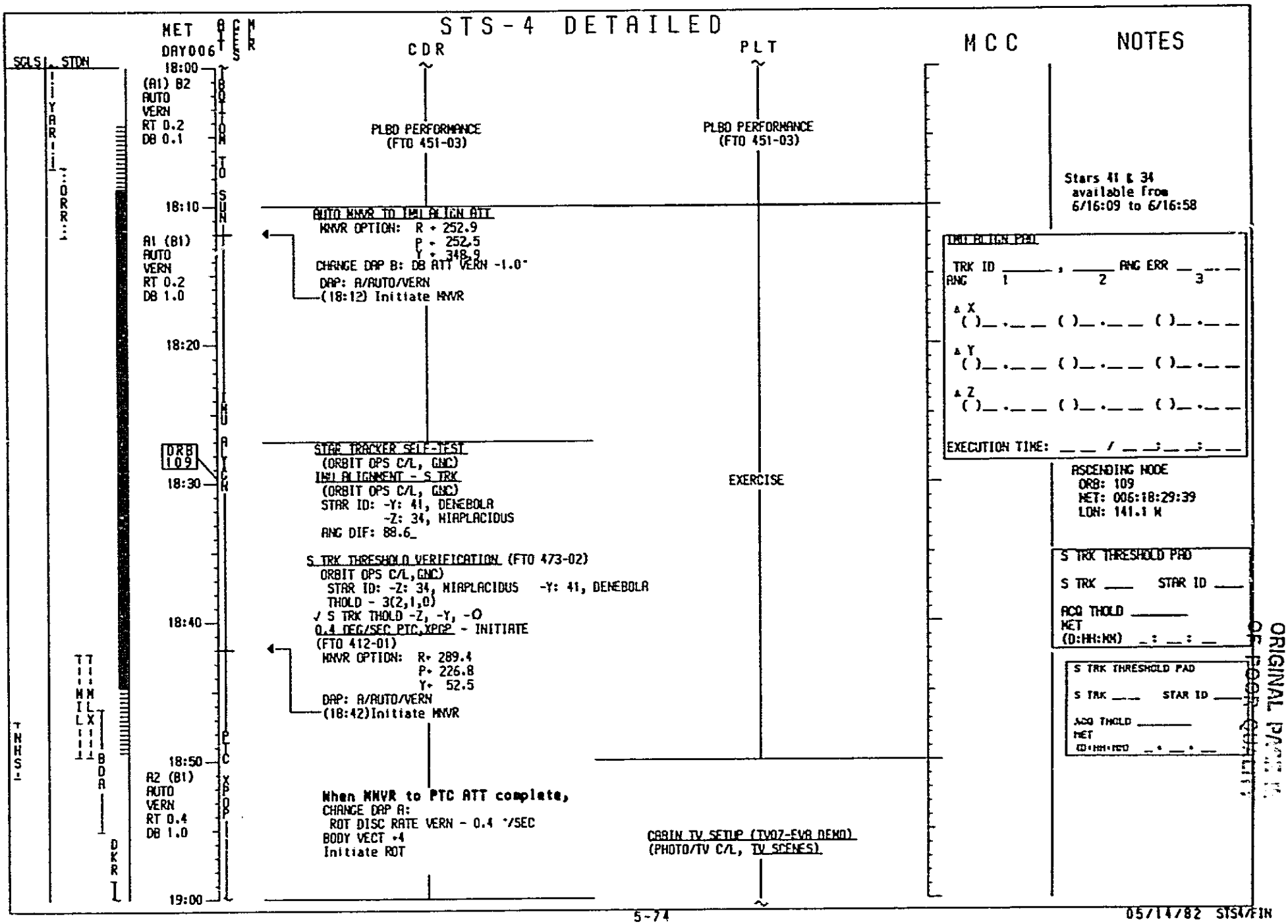

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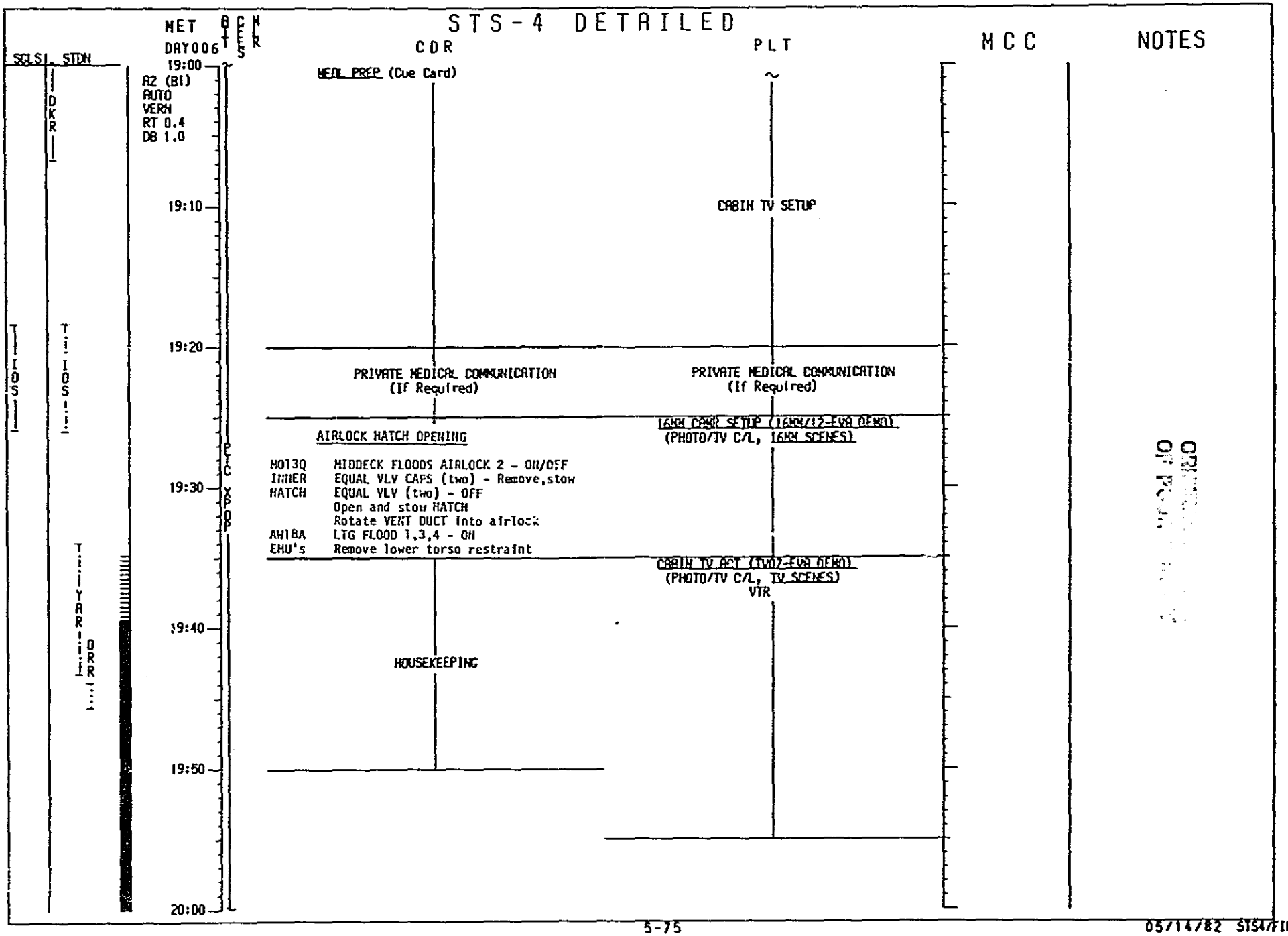

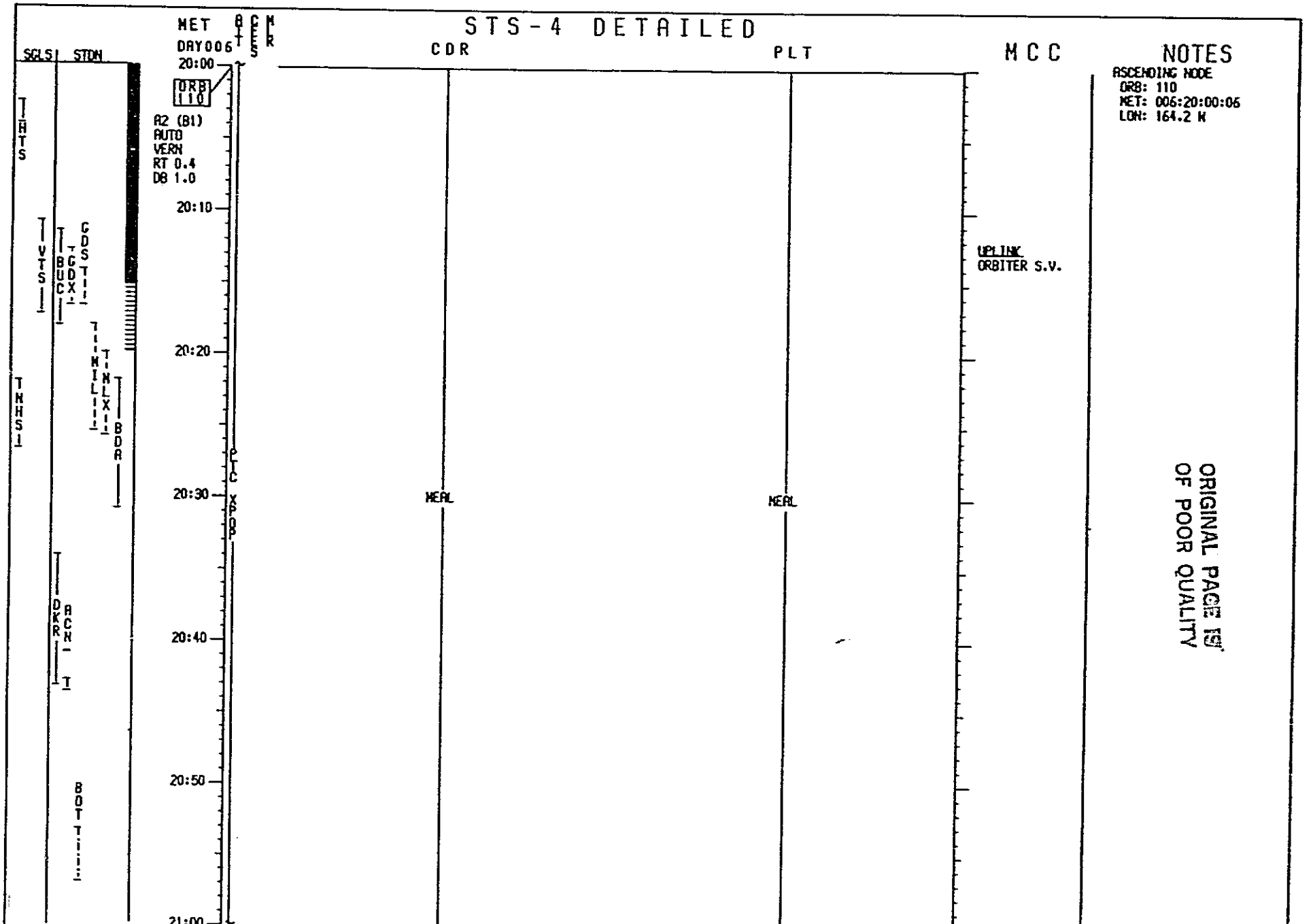

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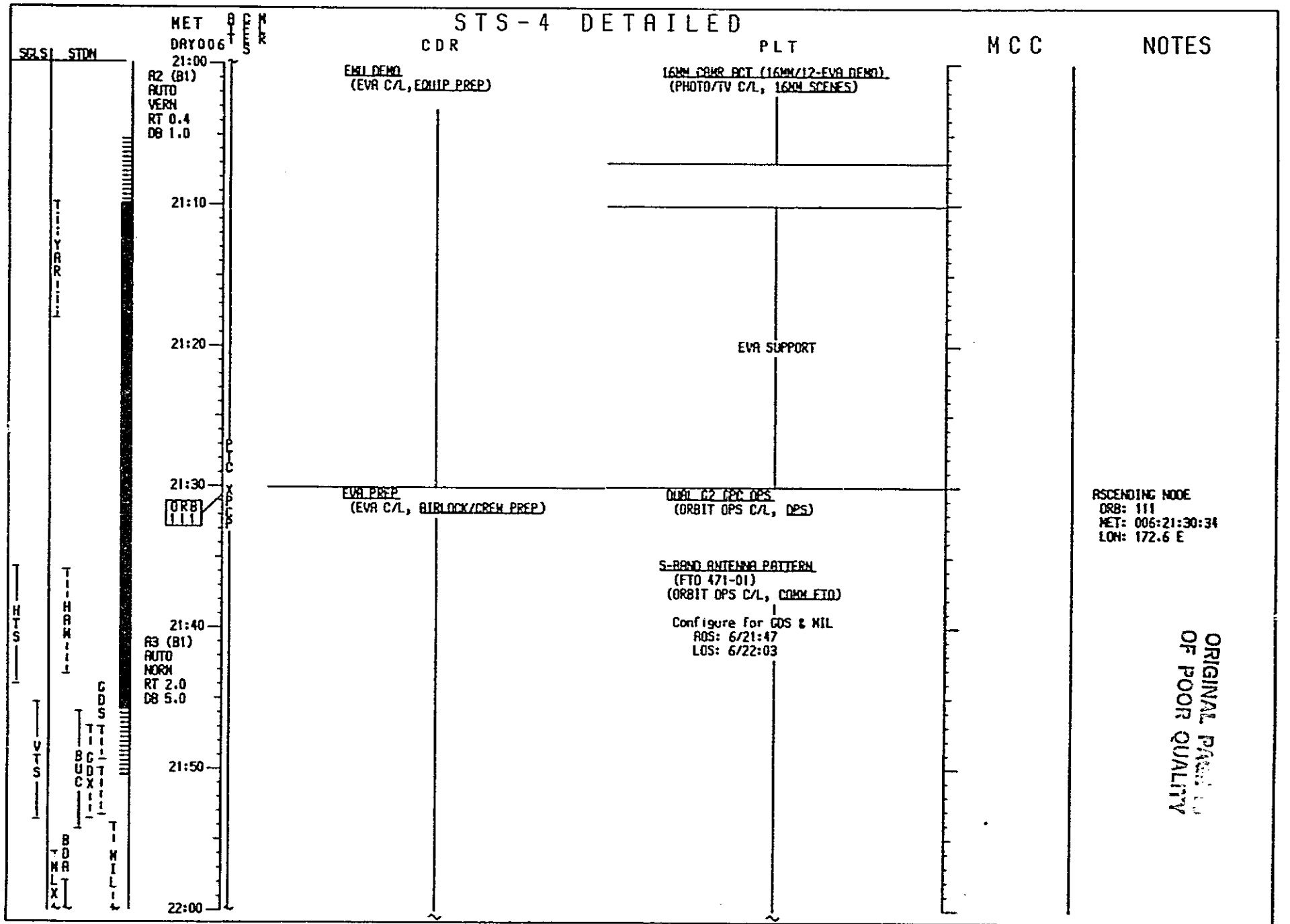

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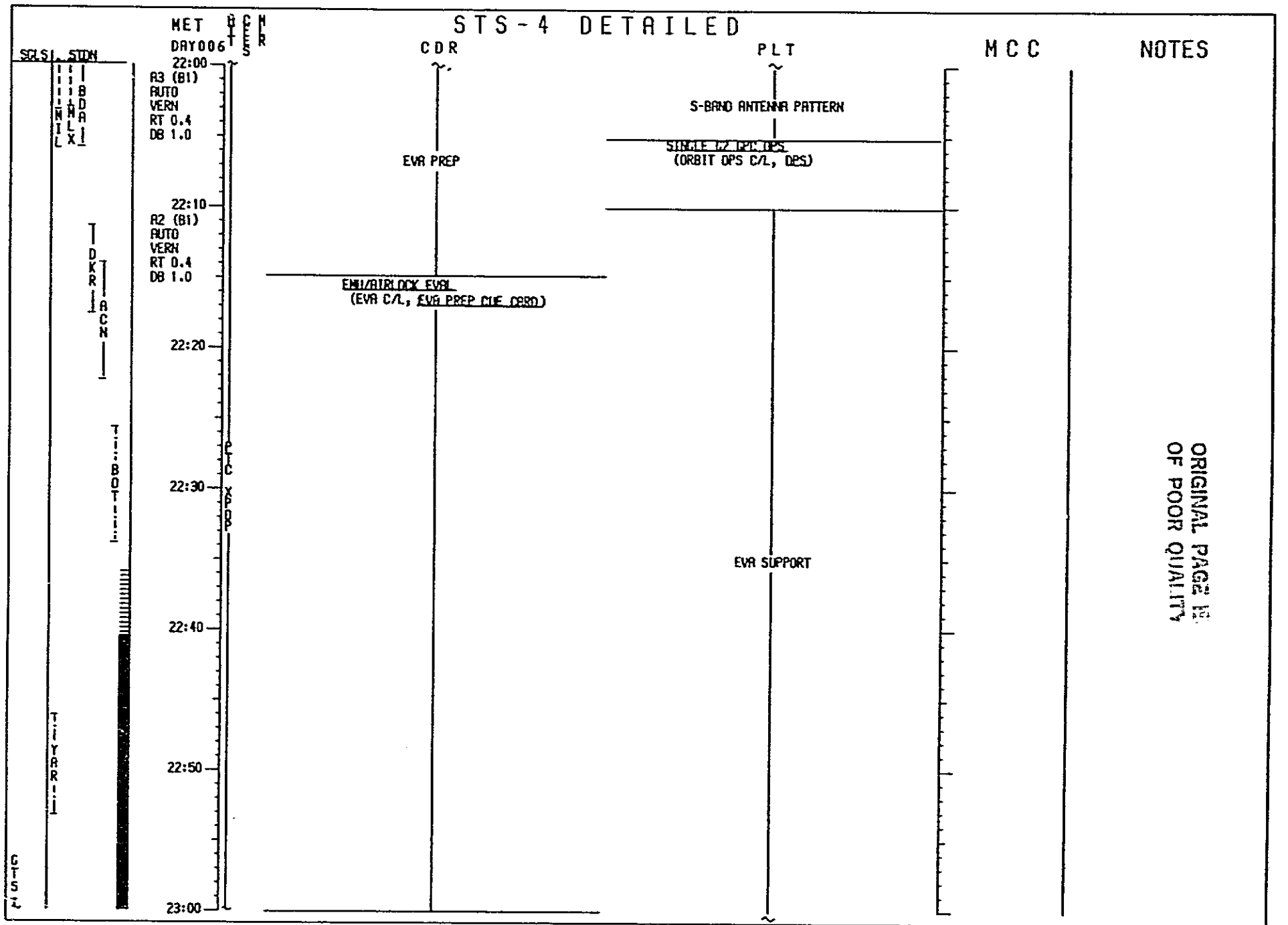

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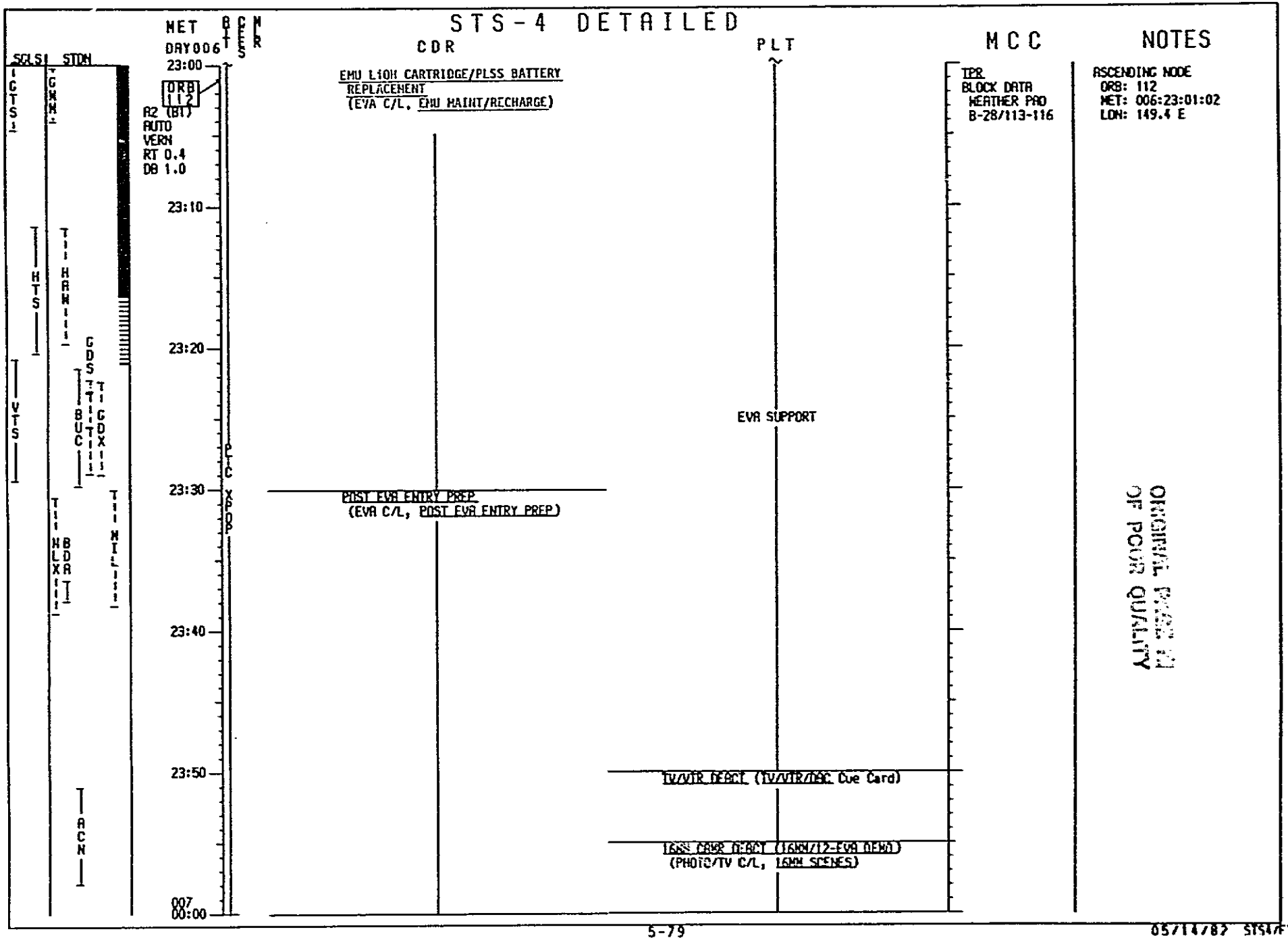

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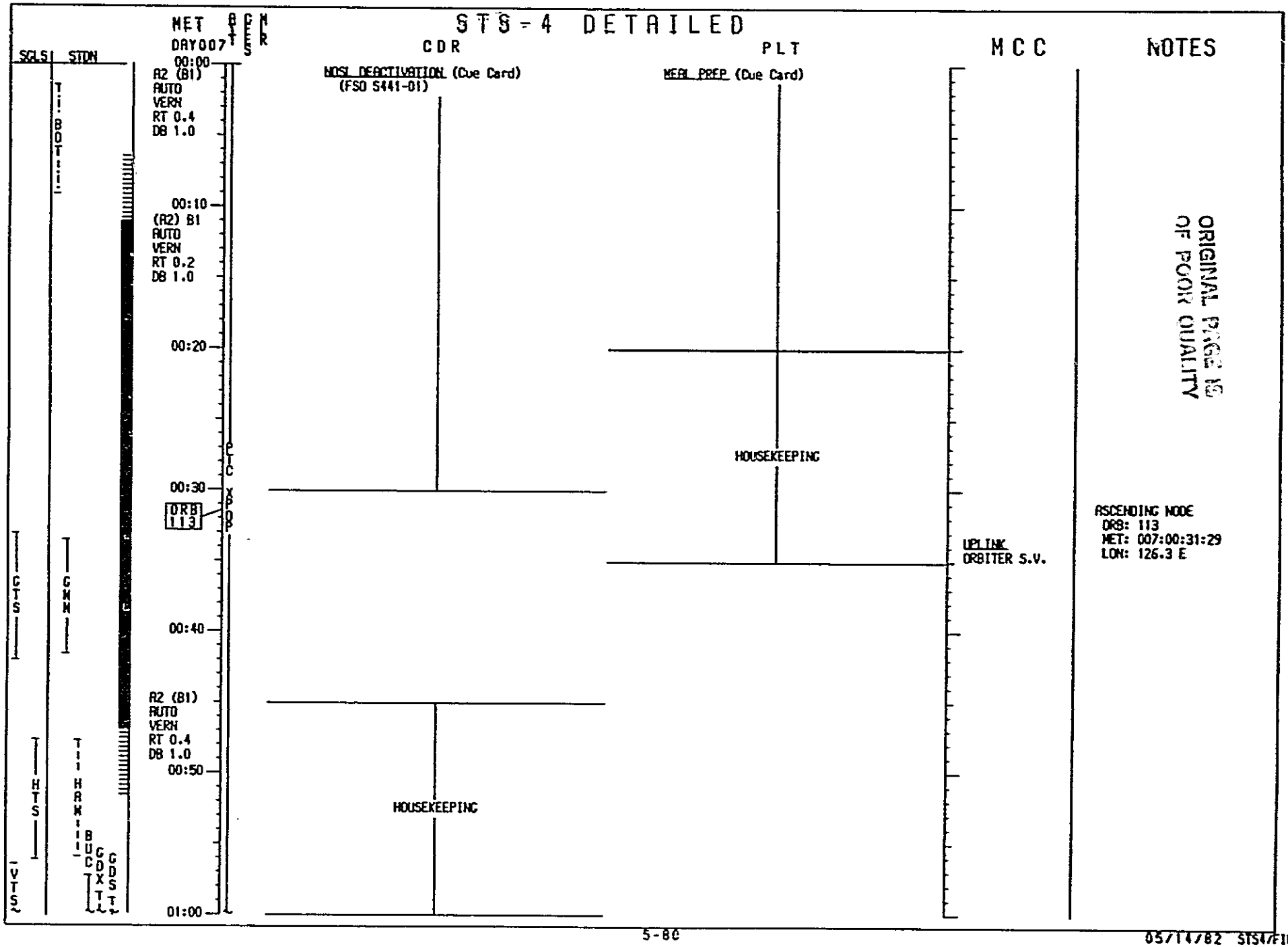
STS-4 DETAILED
MET
DAY007
SCLS
STDN
CDR
PLT
MCC
NOTES
00:00
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
00:10
(A2) B1
AUTO
VERN
RT 0.2
DB 1.0
00:20
00:30
ORB
113
00:40
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
00:50
01:00
NOSE DEACTIVATION (Cue Card)
(FSO 5441-01)
MEAL PREP (Cue Card)
HOUSEKEEPING
HOUSEKEEPING
UPLINK
ORBITER S.V.
ASCENDING NODE
DRB: 113
MET: 007:00:31:29
LON: 126.3 E
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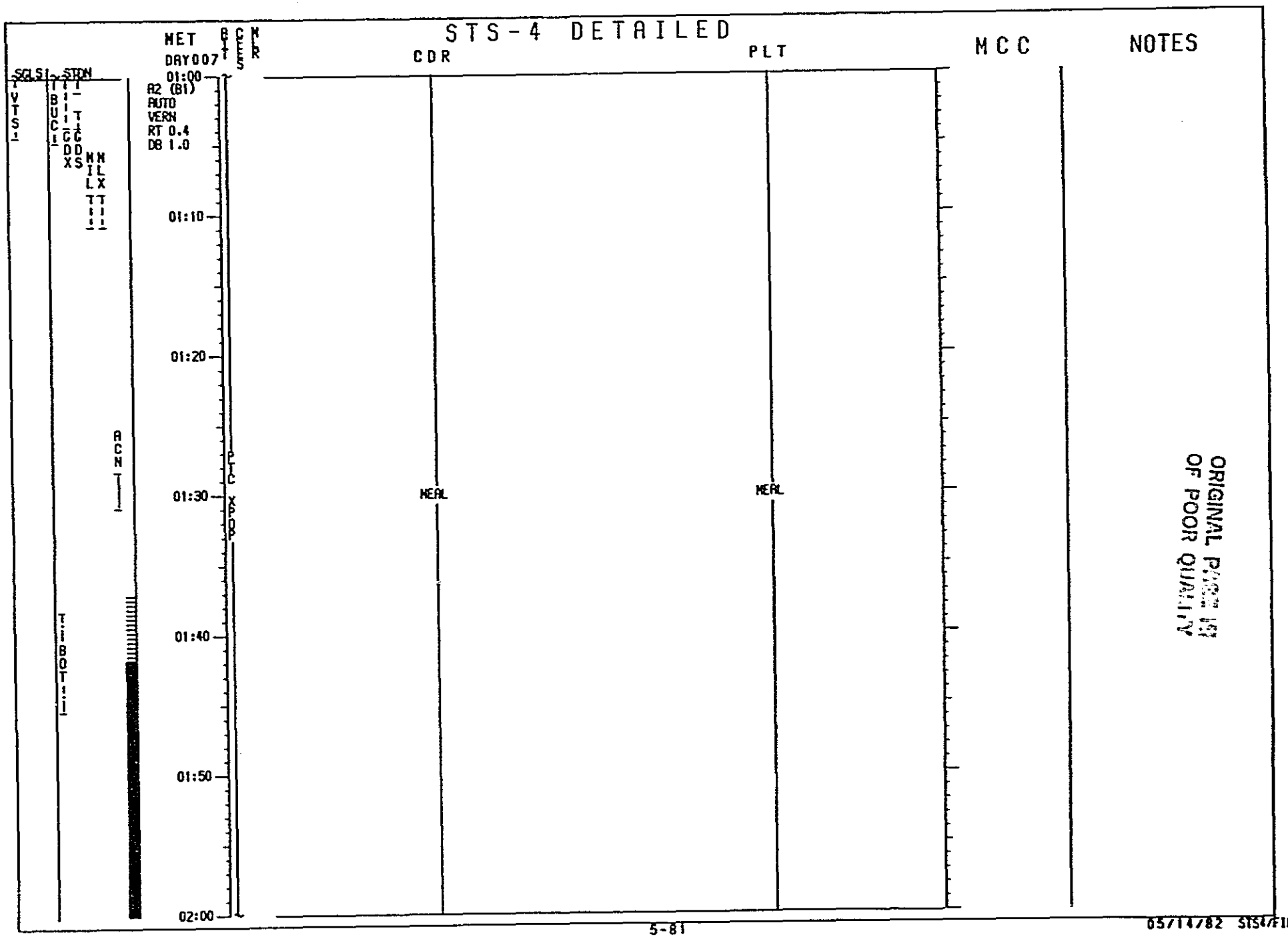
GTS
GMN
HTS
IVTS
BUC
GDS


STS-4 DETAILED
MET
DAY007
CDR
PLT
MCC
NOTES
01:00
01:10
01:20
01:30
01:40
01:50
02:00
MEAL
MEAL
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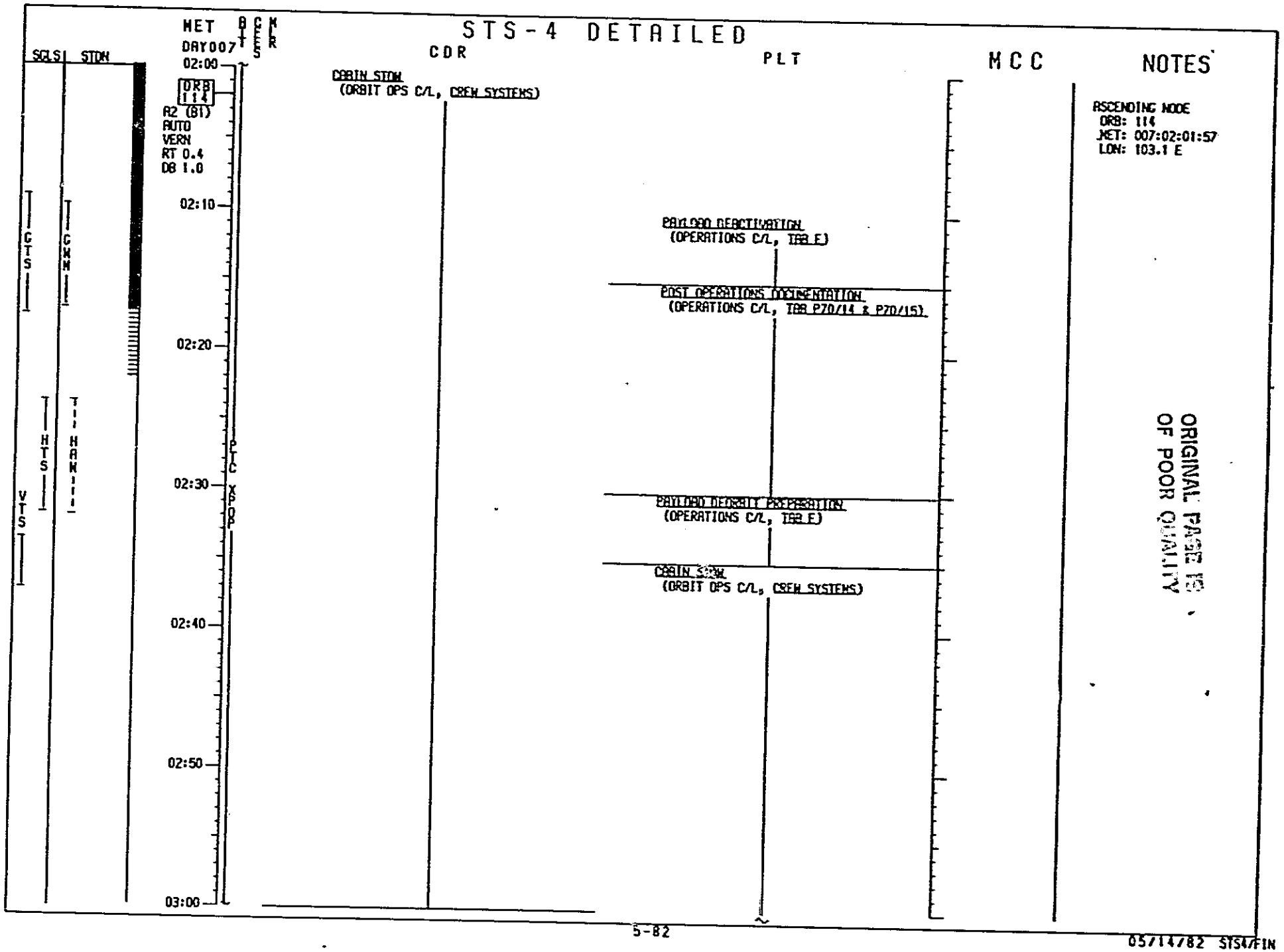

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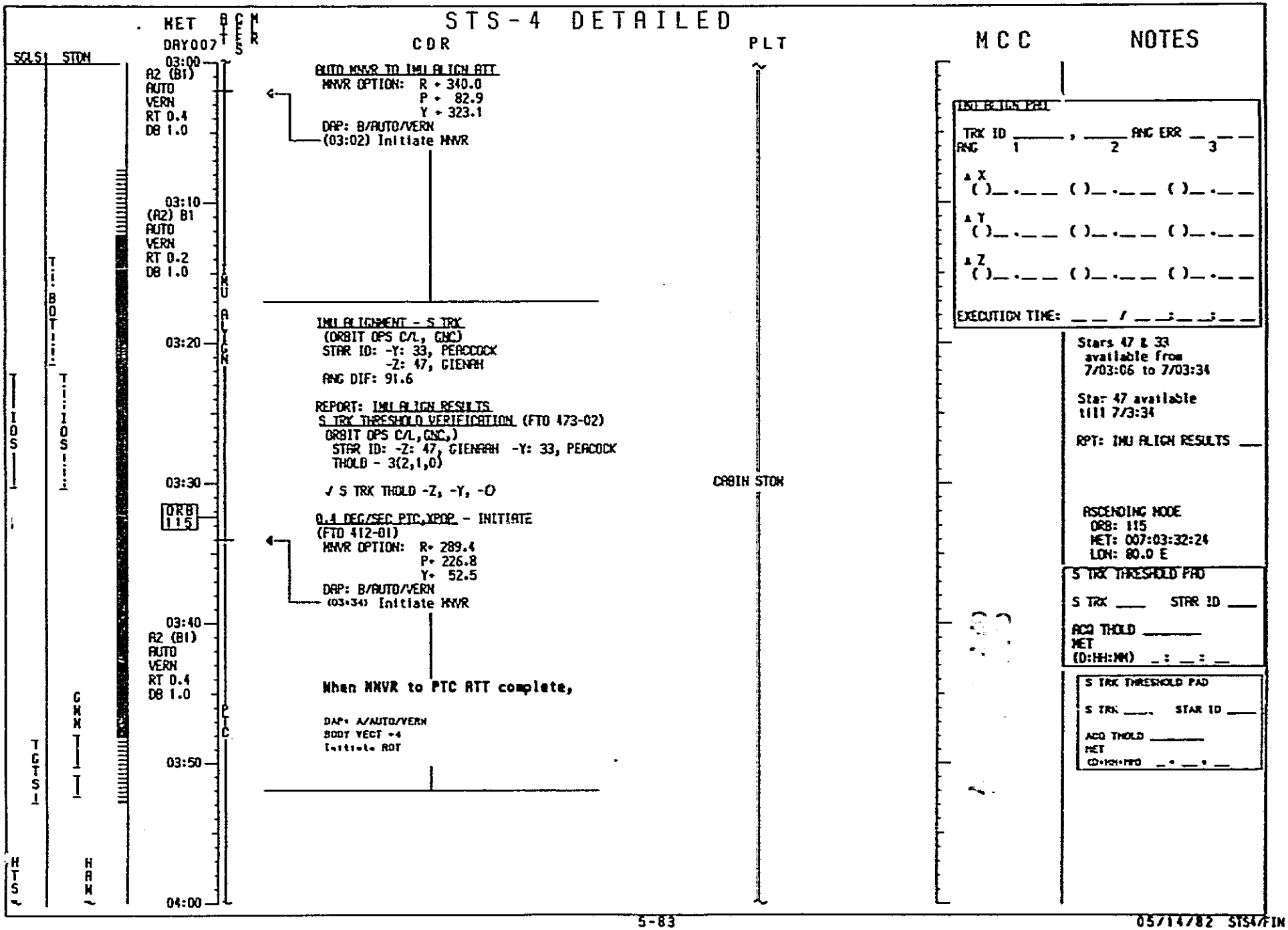

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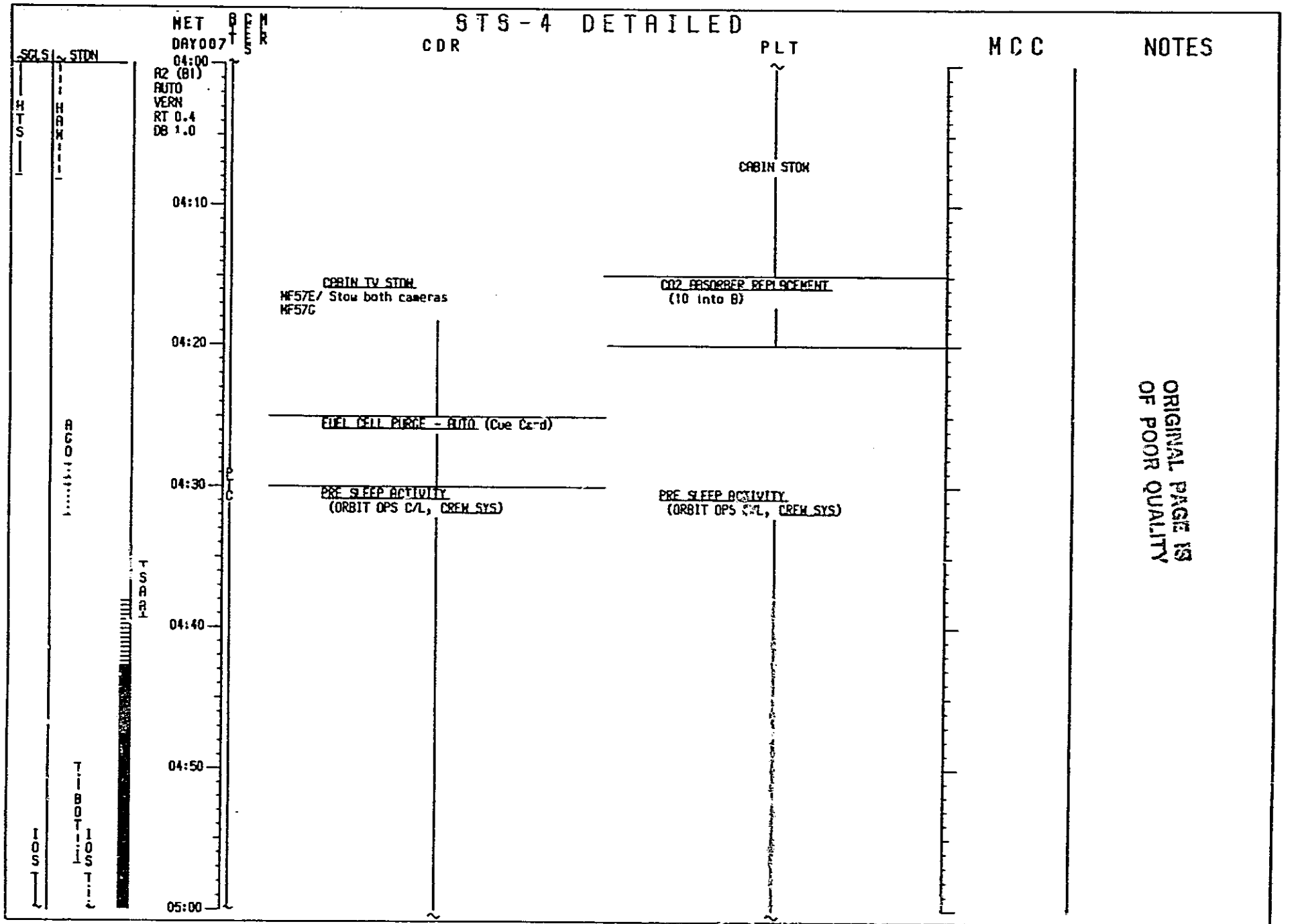

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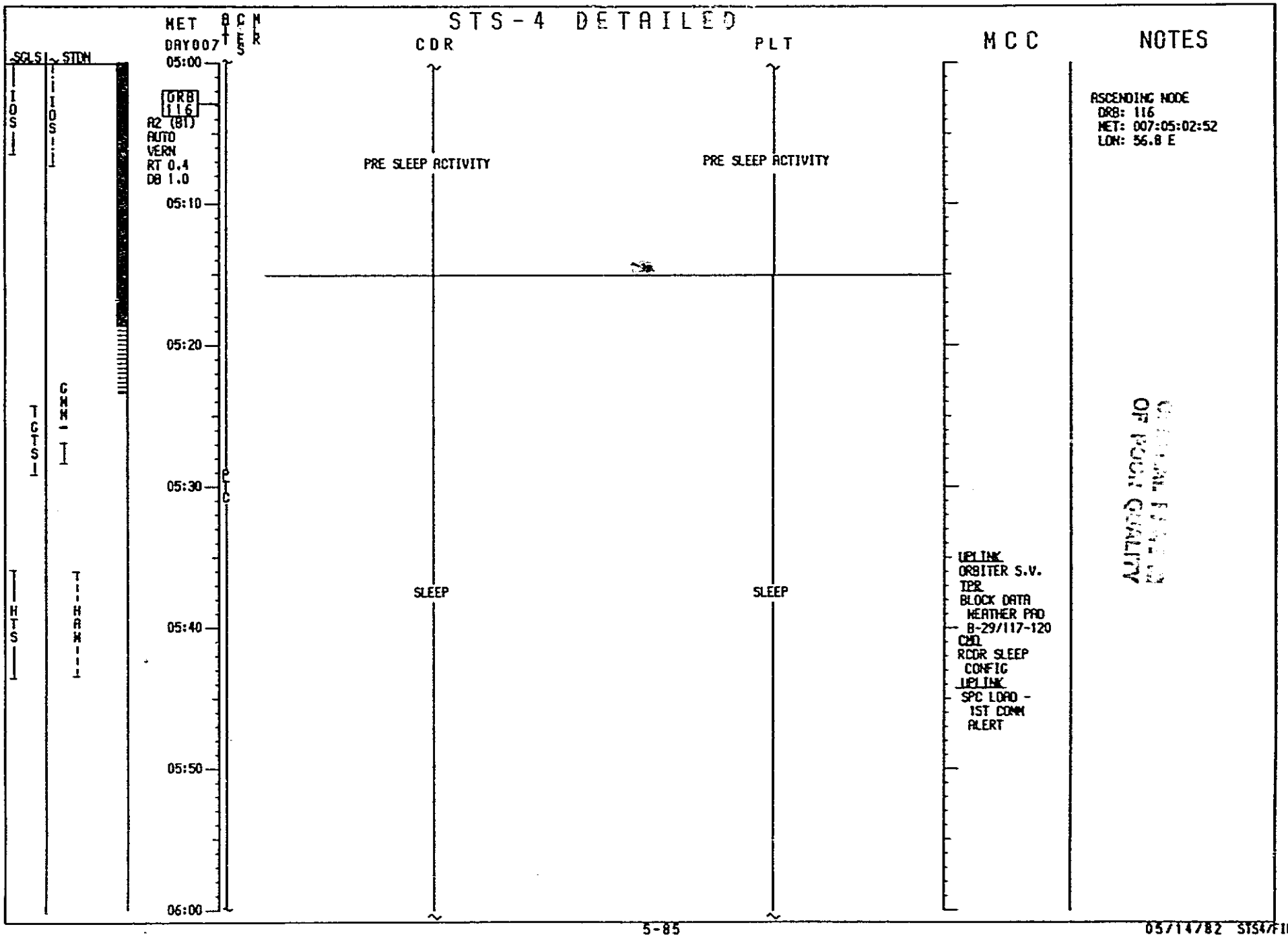

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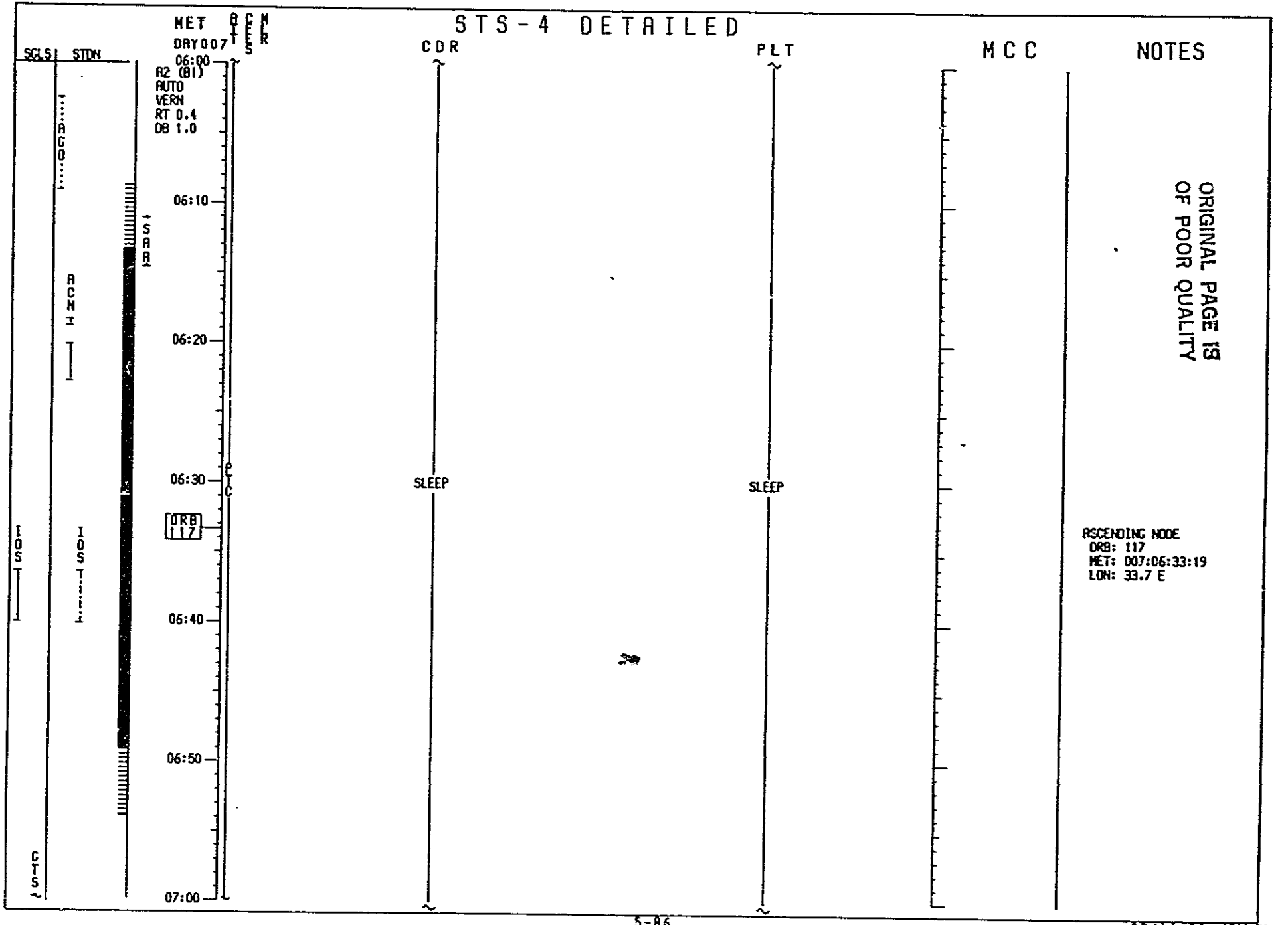
05714782 STS4FIN

STS-4 DETAILED



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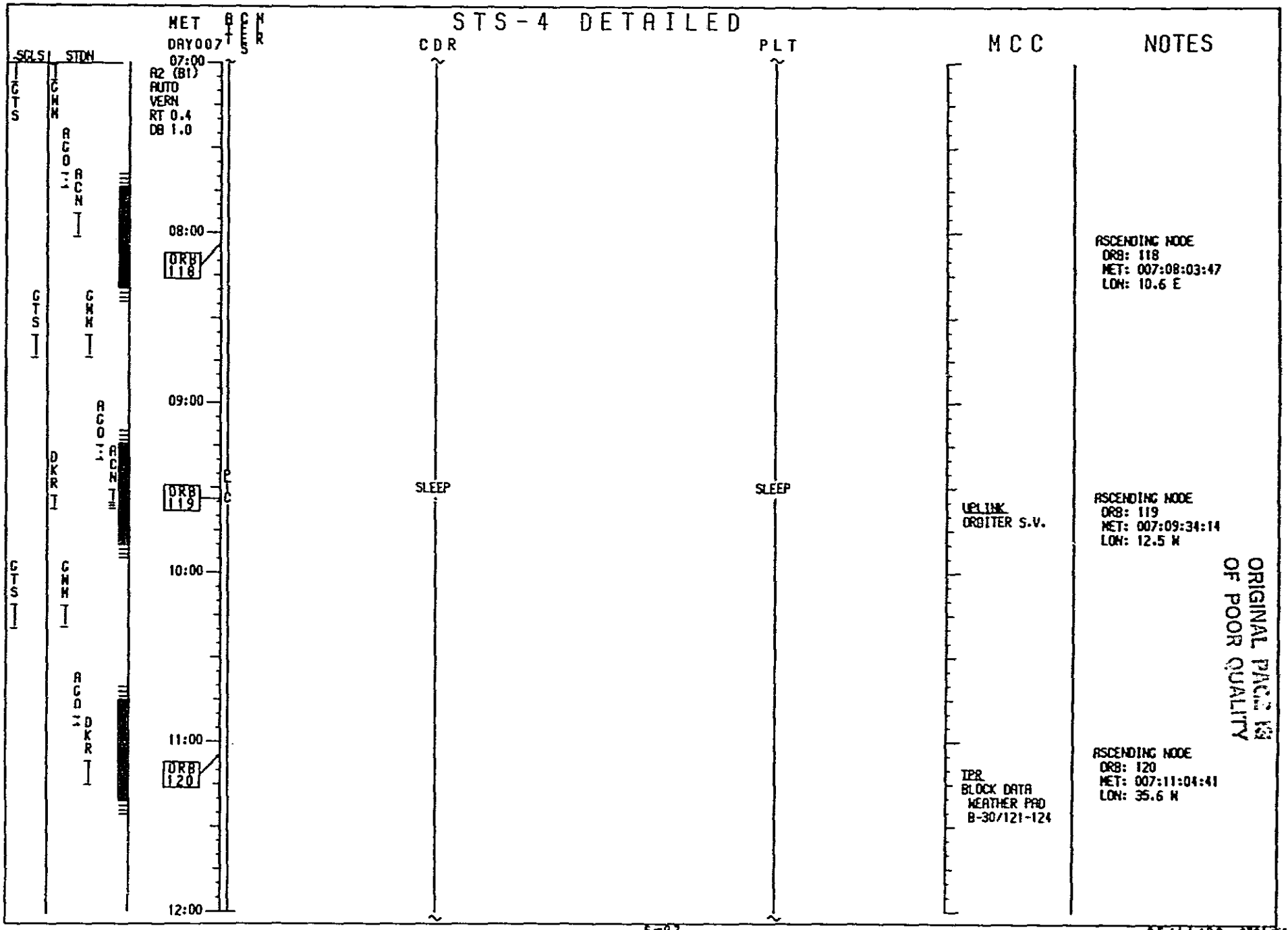

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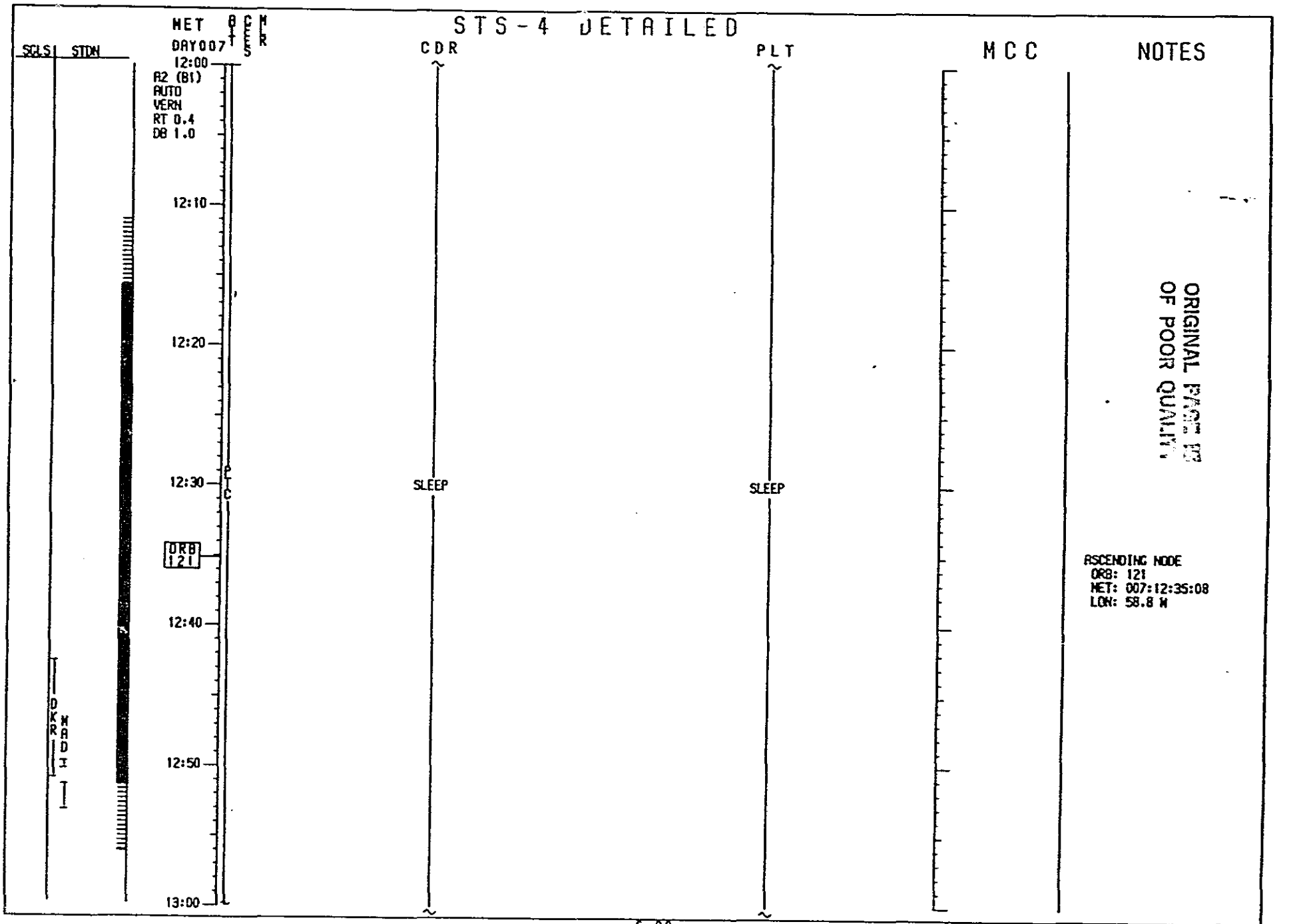

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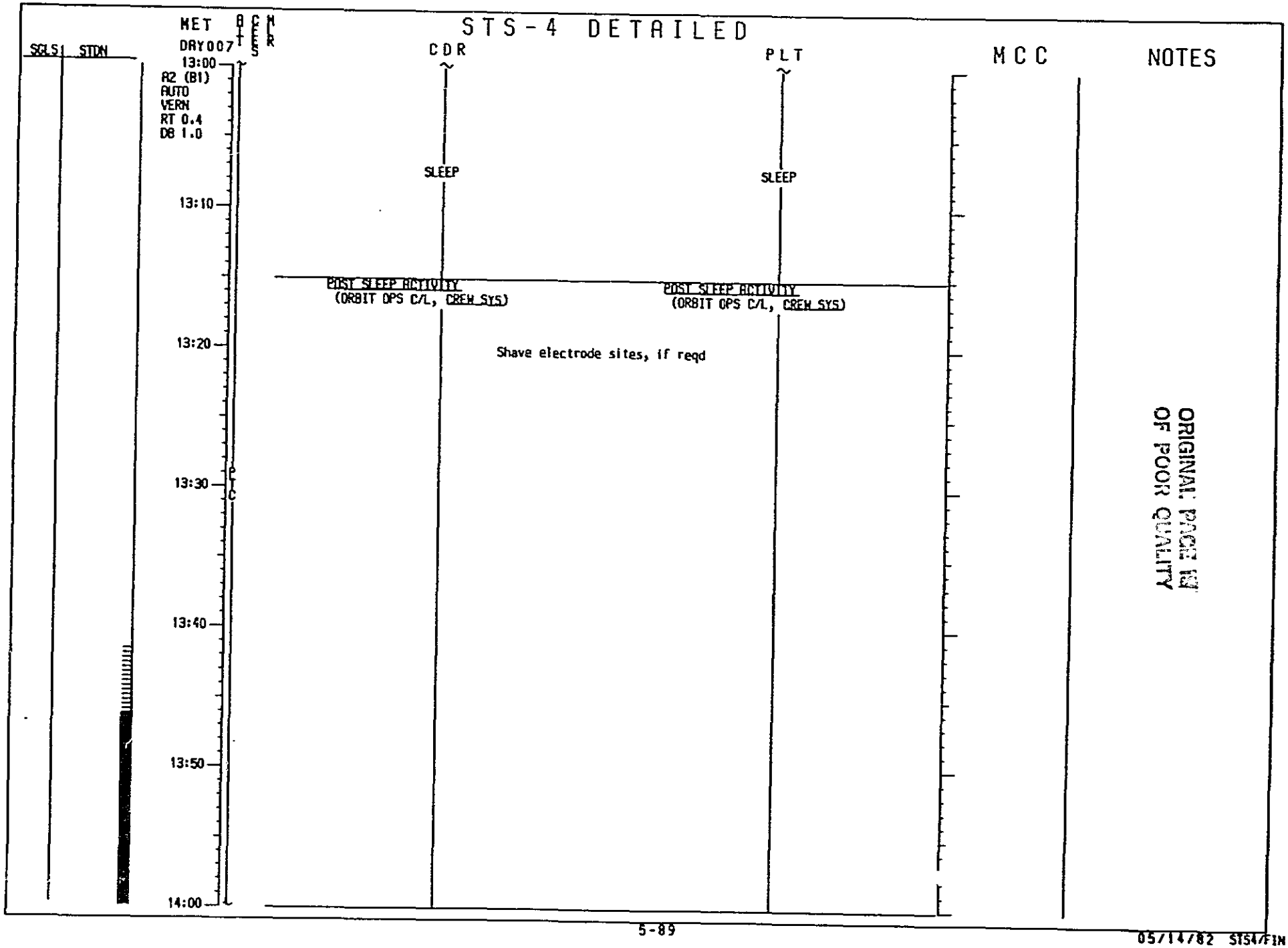
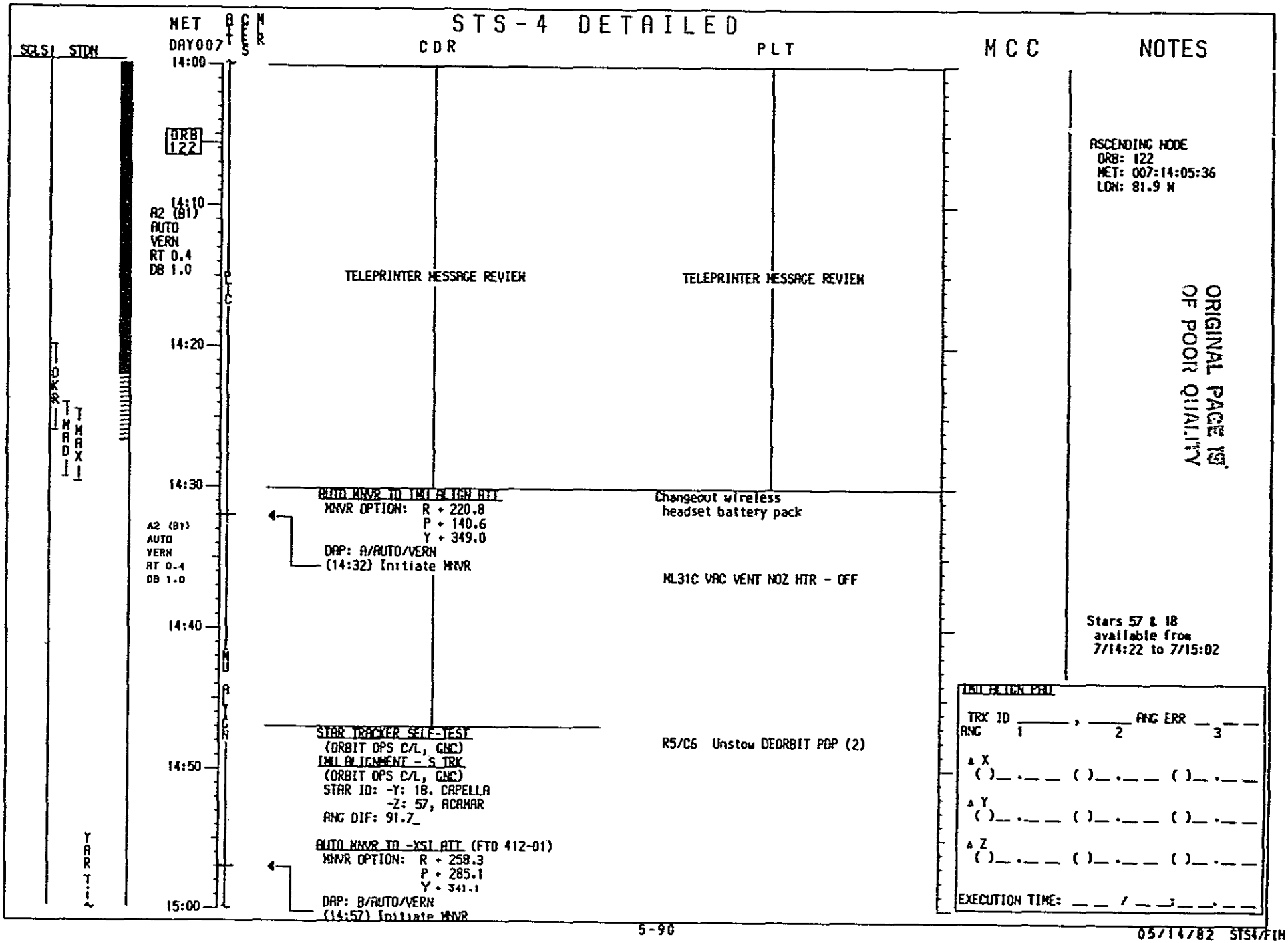


05/14/82 STS4/FIN

STS-4 DETAILED



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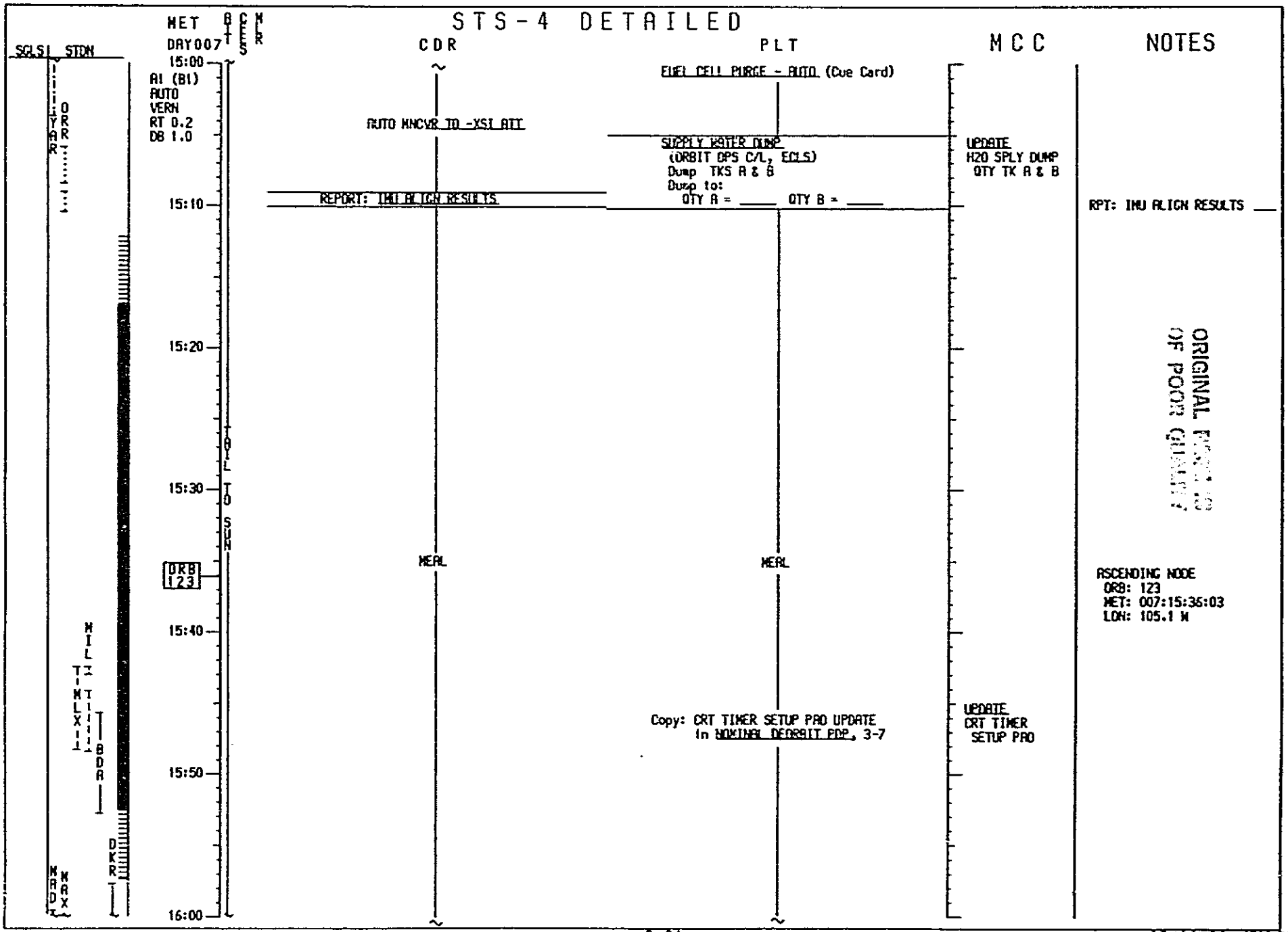
05/14/82 STS4/FIN

STS-4 DETAILED



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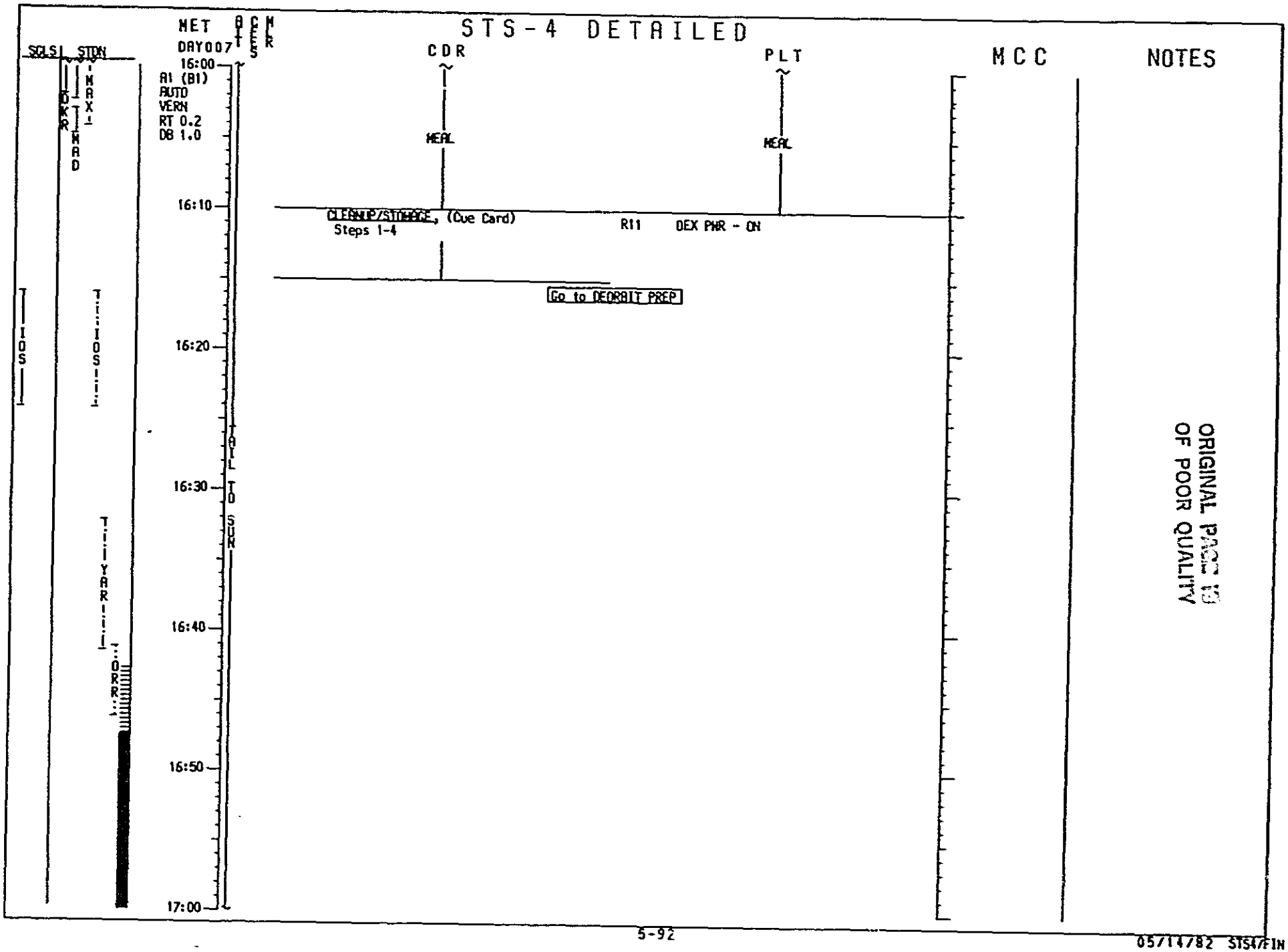


05/14/82 STS4/FIN

24 HOURS AFTER EXTENSION DAY

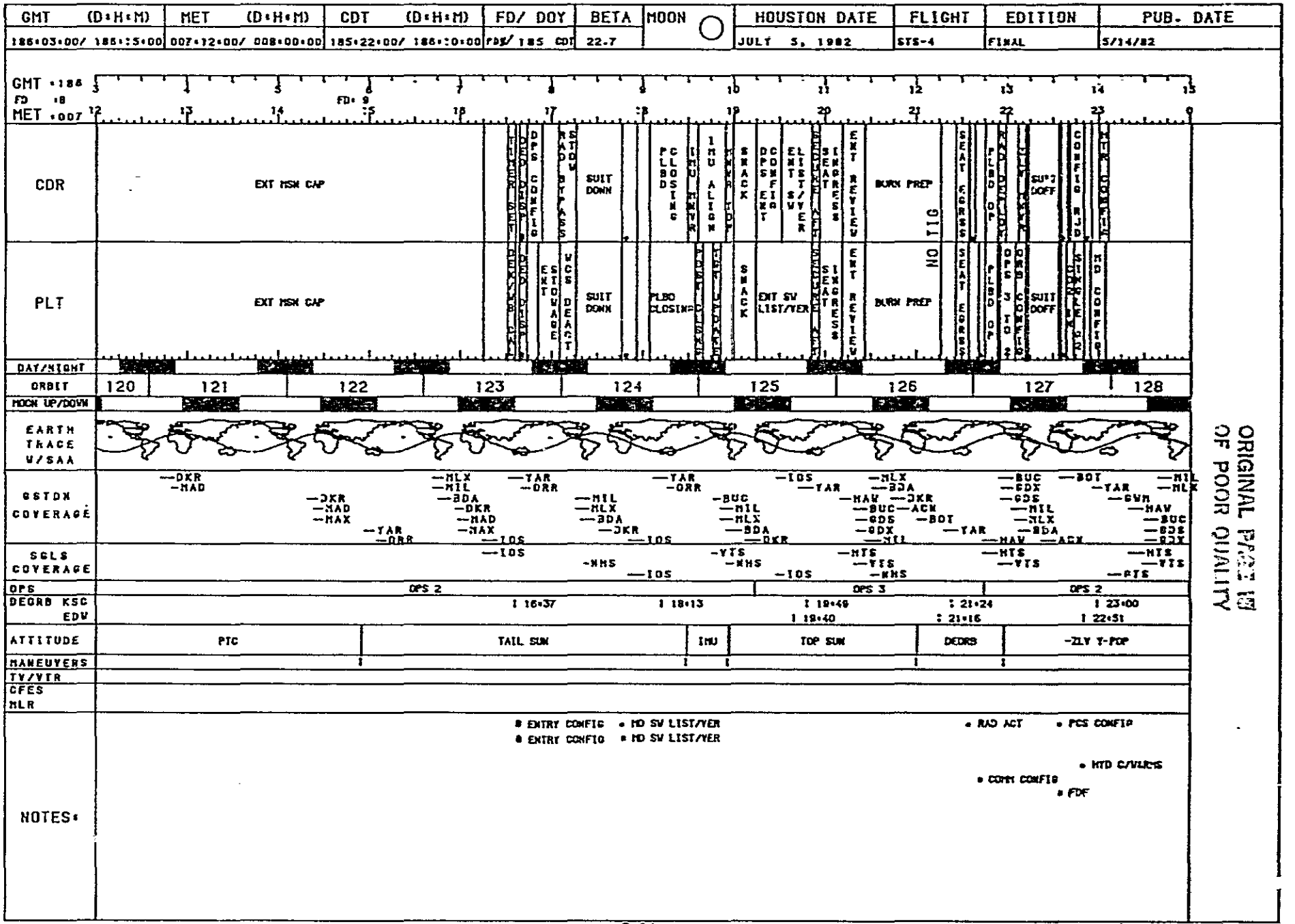
The 24 Hours After Extension Day Timeline is designed to follow a Deorbit Prep Backout on Flight Day 9. It therefore assumes that the nominal timeline plus an extra day have already been accomplished.

Detailed timeline pages are provided from MET 7/22:00 until time for the Deorbit Prep.

To compute the MET time at which this timeline is entered, take the Deorbit Burn TIG time and add ~1 hr 50 min for Deorbit Prep Backout. Note that no activities are scheduled for the first hour and 15 minutes to allow extra time for reconfiguration or troubleshooting.

24 HRS AFTER EXTENSION DAY

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
186:03:00/ 186::5:00	007:12:00/ 008:00:00	185:22:00/ 186::0:00	FD9/ 185 CDT	22.7		JULY 5, 1982	STS-4	FINAL	5/14/82



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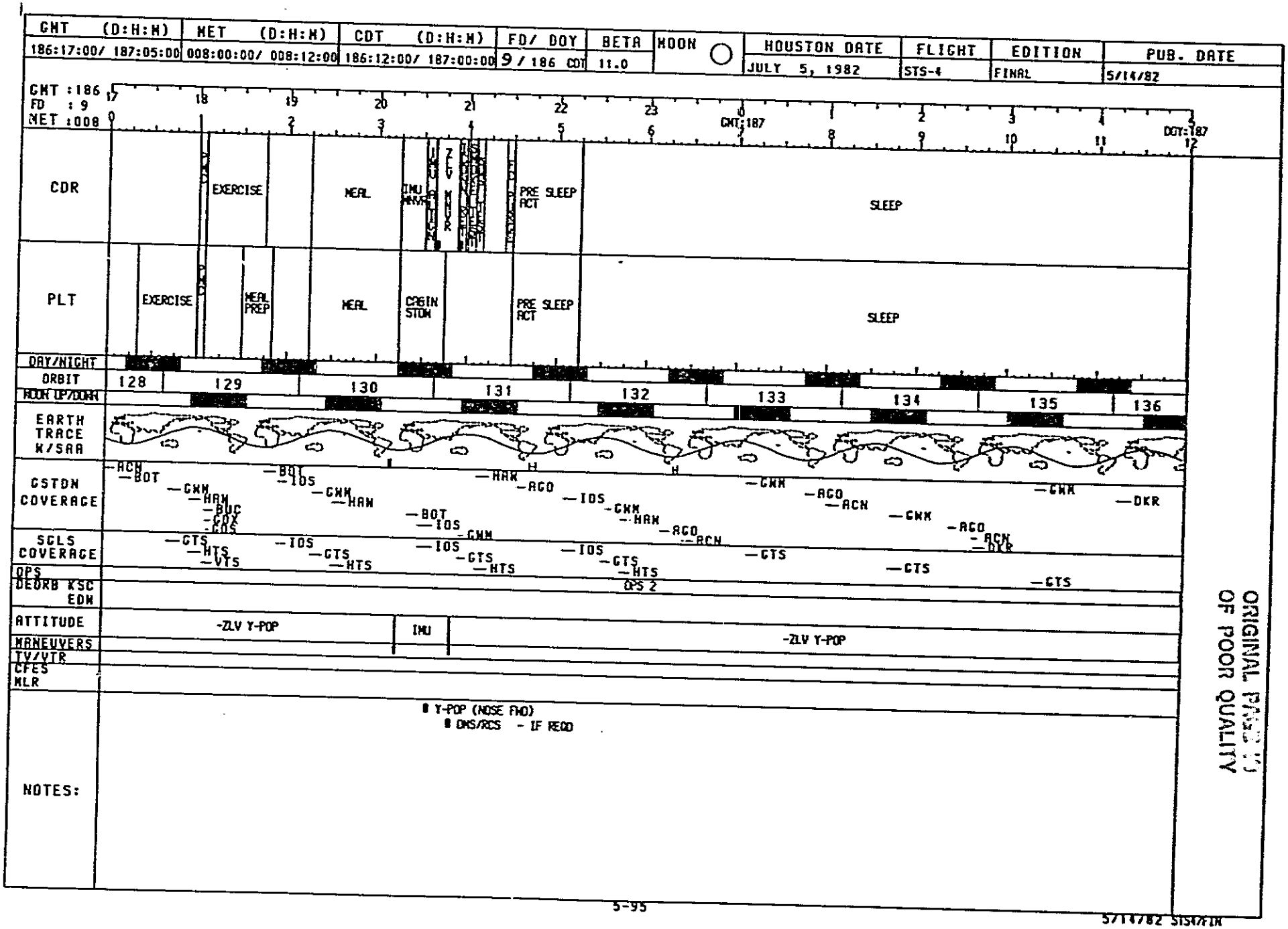

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GNT (D:H:M)	MET (D:H:M)	GDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
187:05:00/ 187:17:00	008:12:00/ 009:00:00	187:00:00/ 187:12:00	10/ 187 GDT	12.7	○	JULY 6, 1982	STS-4	FINAL	5/14/82

GNT :187
FD :9
MET :008

FD:10

COR: SLEEP | POST SLEEP ACT | TPR MSG REVIEW | MEAL | SUIT DONN | PLBD CLOSING | SNACK | DOFF CONFIG | ENT SM LIST/VER | BURN PREP | DEORBIT BURN | LANDING

PLT: SLEEP | POST SLEEP ACT | TPR MSG REVIEW | MEAL | SUIT DONN | PLBD CLOSING | SNACK | ENT SM LIST/VER | BURN PREP | DEORBIT BURN | LANDING

DAY/NIGHT

ORBIT: 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | 144

MOON UP/DOWN

EARTH TRACE M/SAA

GSTDN COVERAGE

SGLS COVERAGE

OPS: OPS 2 | OPS 3

DEORB KSC: 15:11 | 16:47 | 18:22 | 19:58 | 21:34
EDN: 18:14 | 19:50 | 21:26 | 23:01

ATTITUDE: -ZLV Y-POP | TAIL SUN | IMU | TOP SUN | ET-5

MANEUVERS

TV/VTR

CFES

MLR

NOTES:

8 ENTRY CONFIG ○ NO SM LIST/VER
8 ENTRY CONFIG ● NO SM LIST/VER

▲ LAST MEAL CLEANUP

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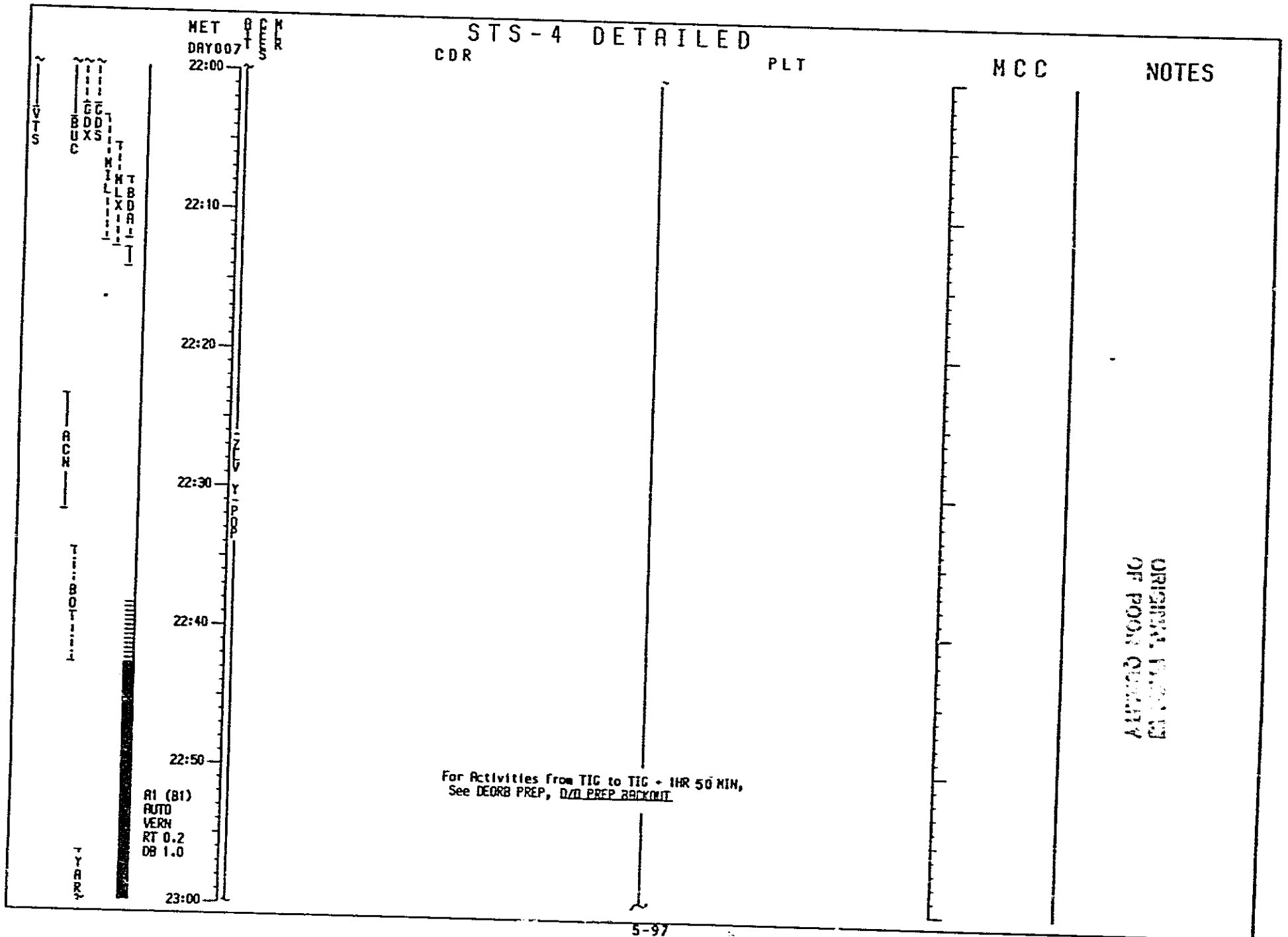
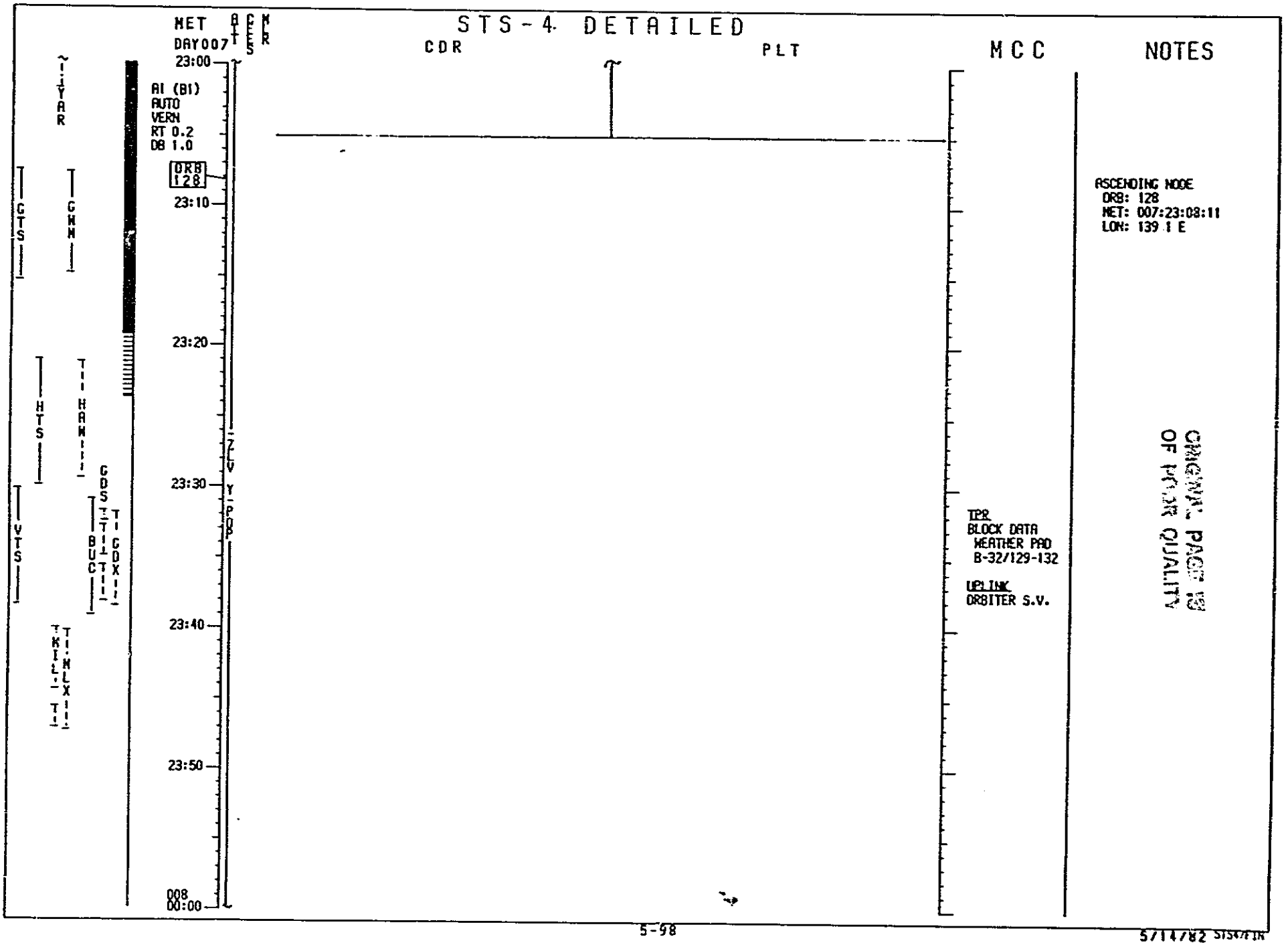
5/14/82 SISOFIN


STS-4 DETAILED
MET
DAY007
22:00
22:10
22:20
22:30
22:40
22:50
23:00
CDR
PLT
MCC
NOTES
VTS
BUC
GDX
GDS
MIL
MLX
TBDA
ACN
TBOD
TYAR
ACMR
ATTS
INLV
YIPOP
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
For Activities from TIG to TIG + 1HR 50 MIN,
See DEORB PREP, D/O PREP BACKOUT
5-97

STS-4 DETAILED



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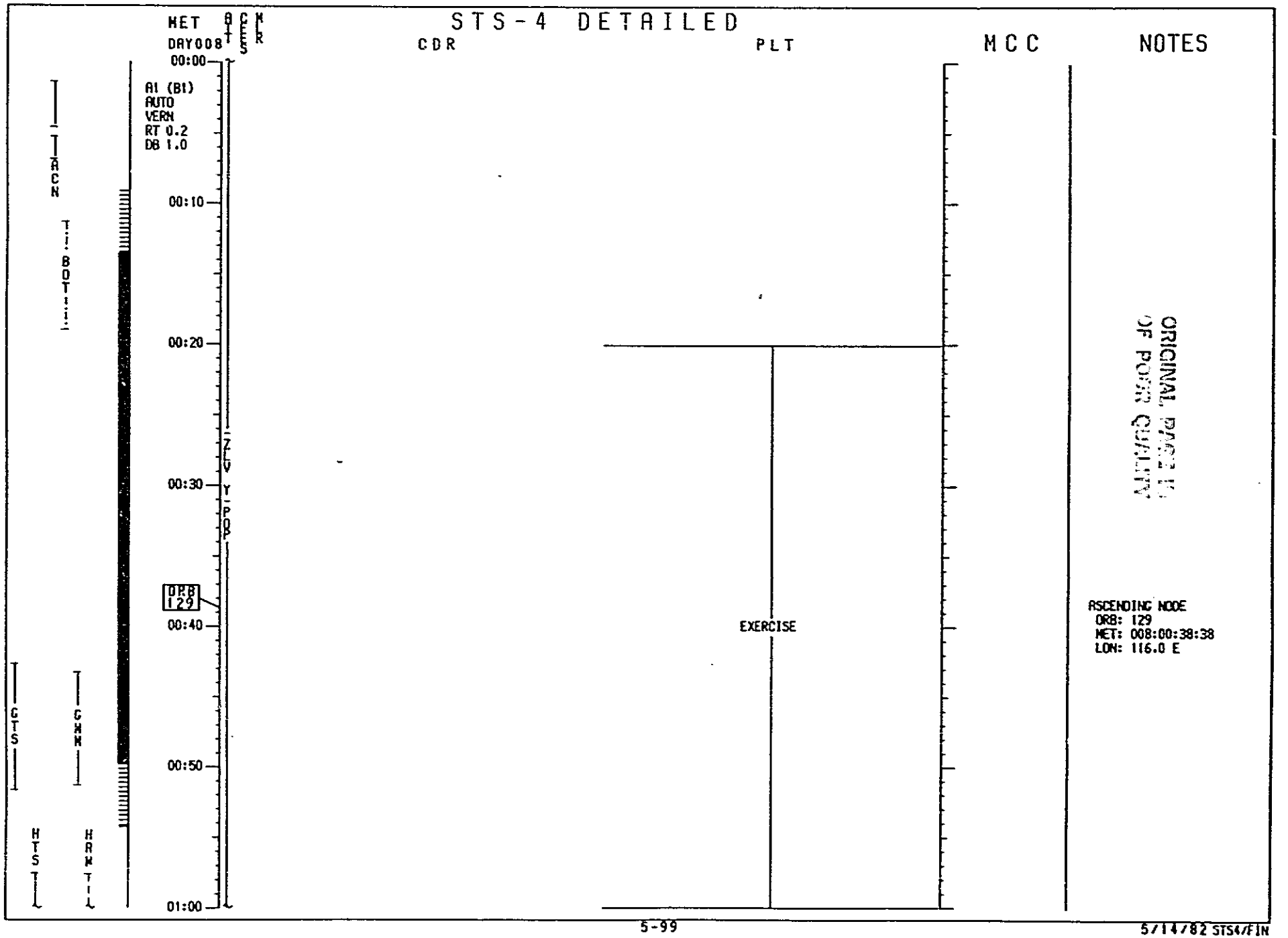
5/14/82 STS/FIN

STS-4 DETAILED



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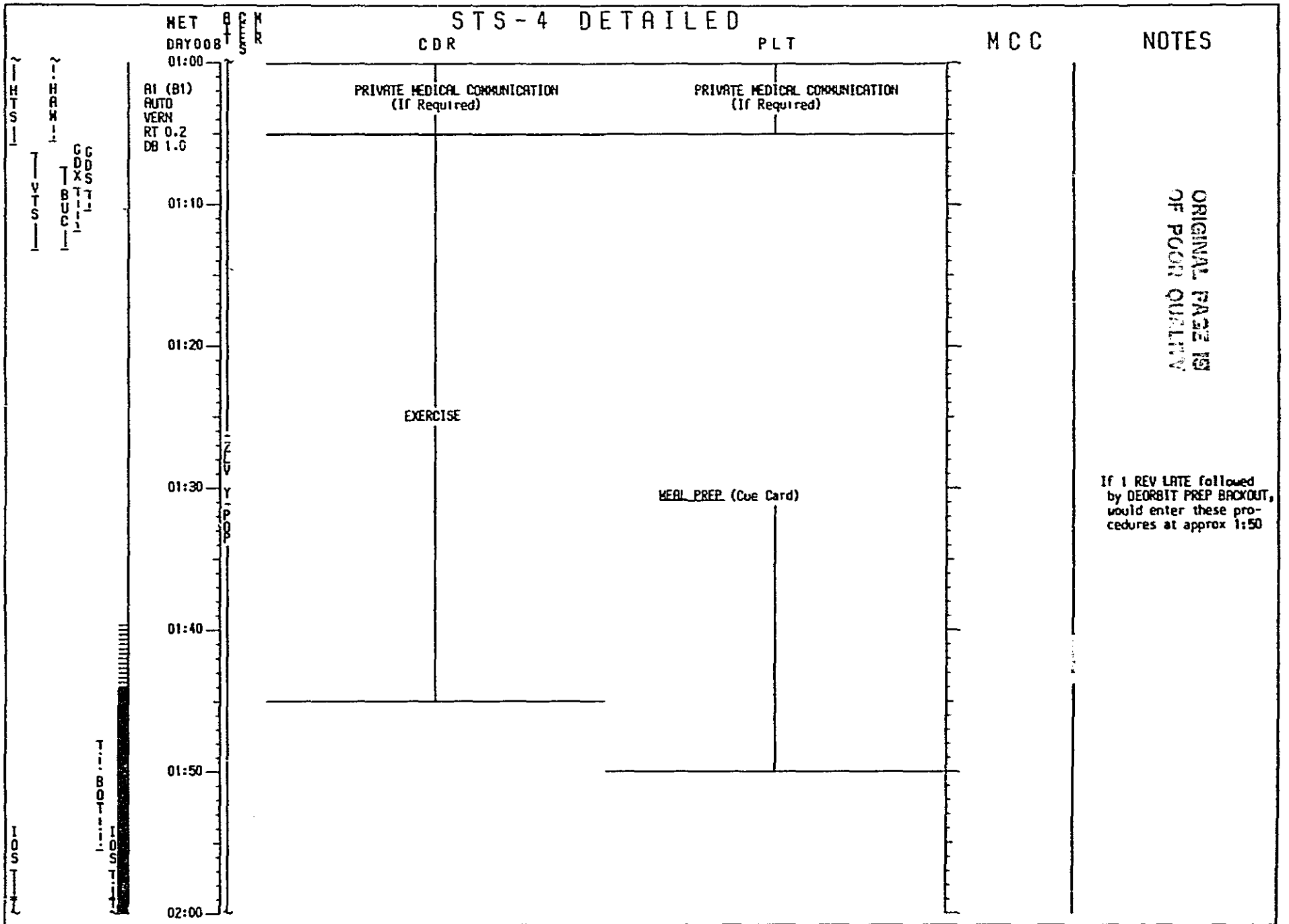
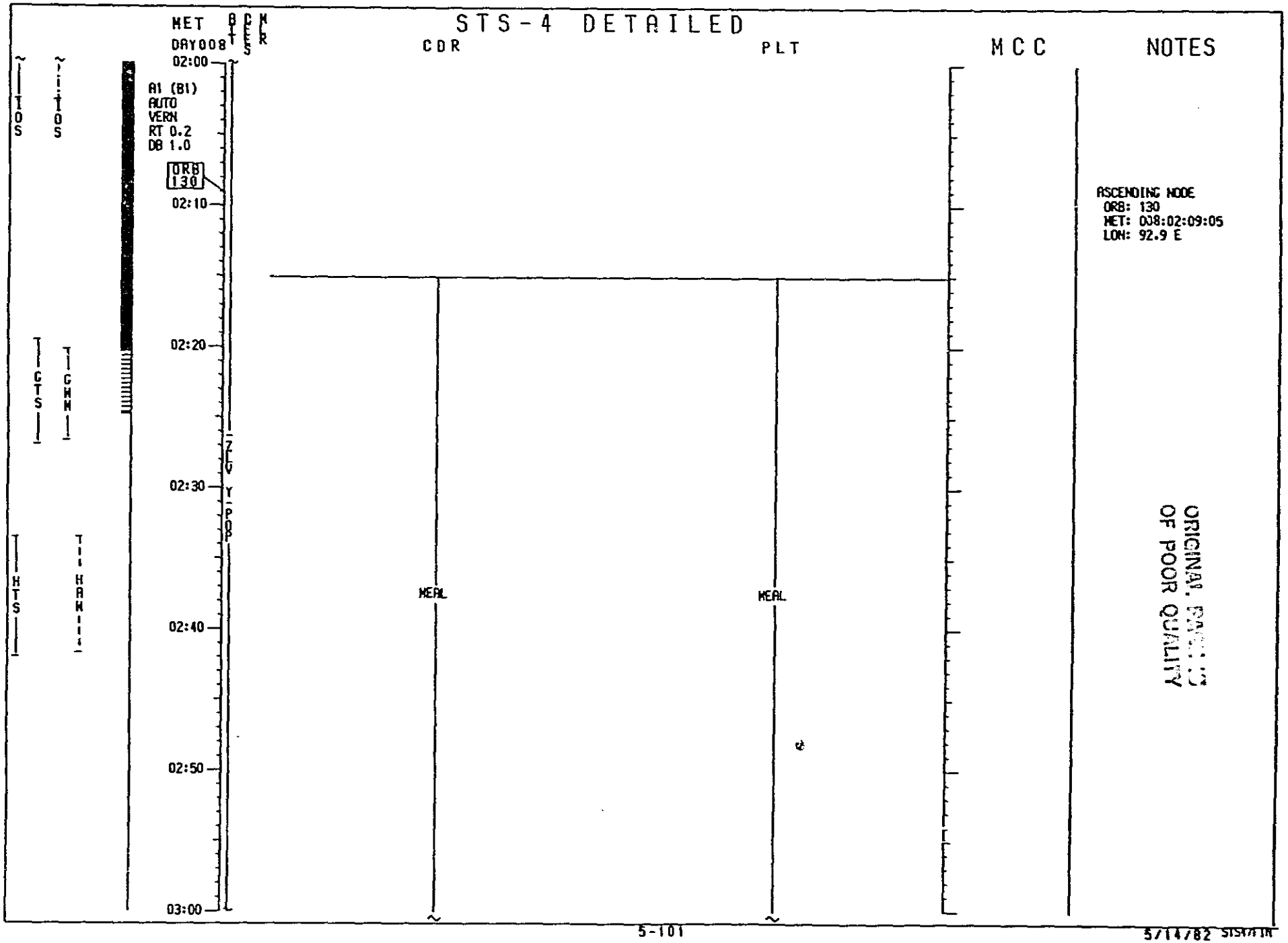
5/14/82 STS4/FIN

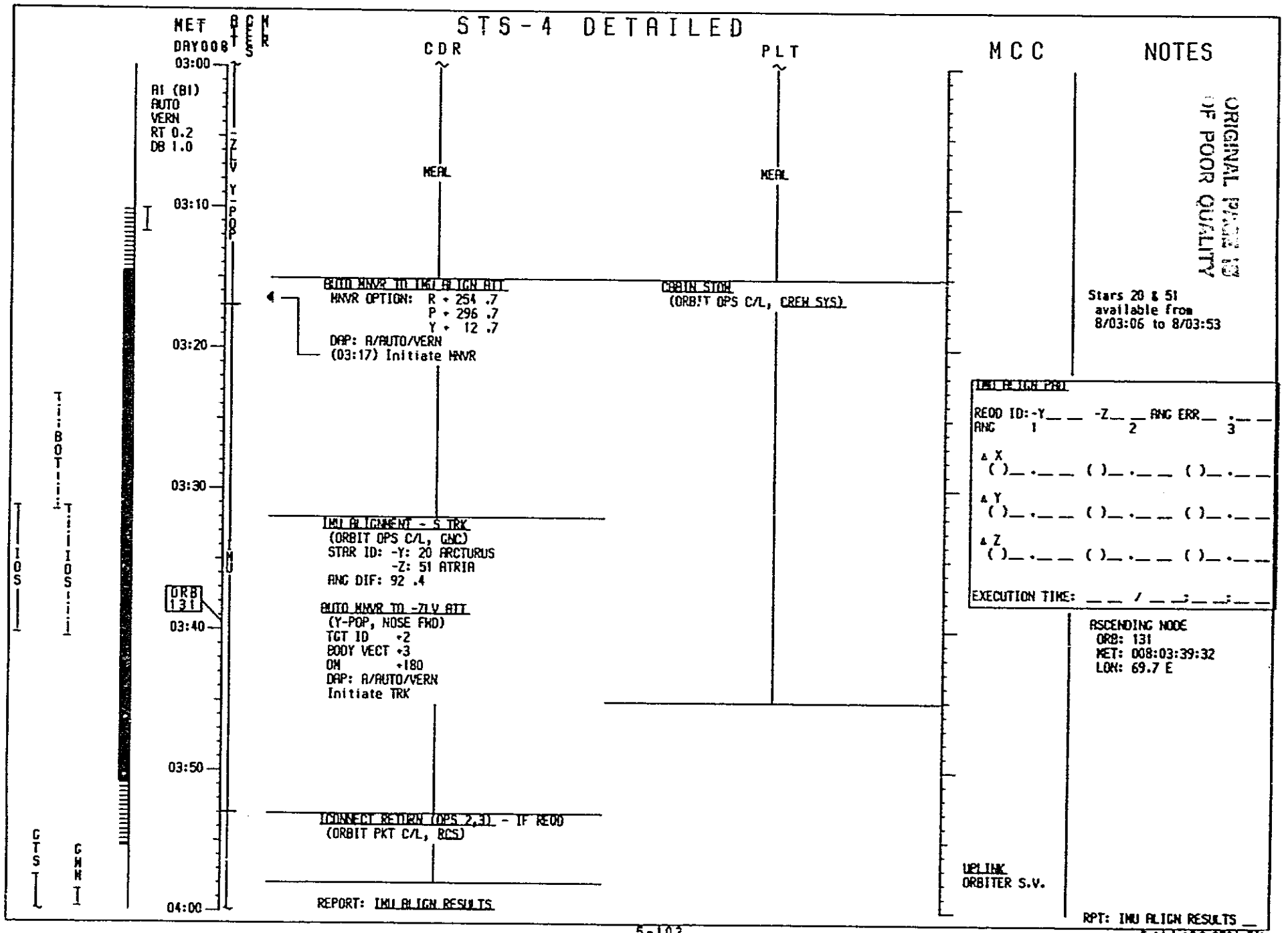
STS-4 DETAILED



5/14/82 STS4/FIN

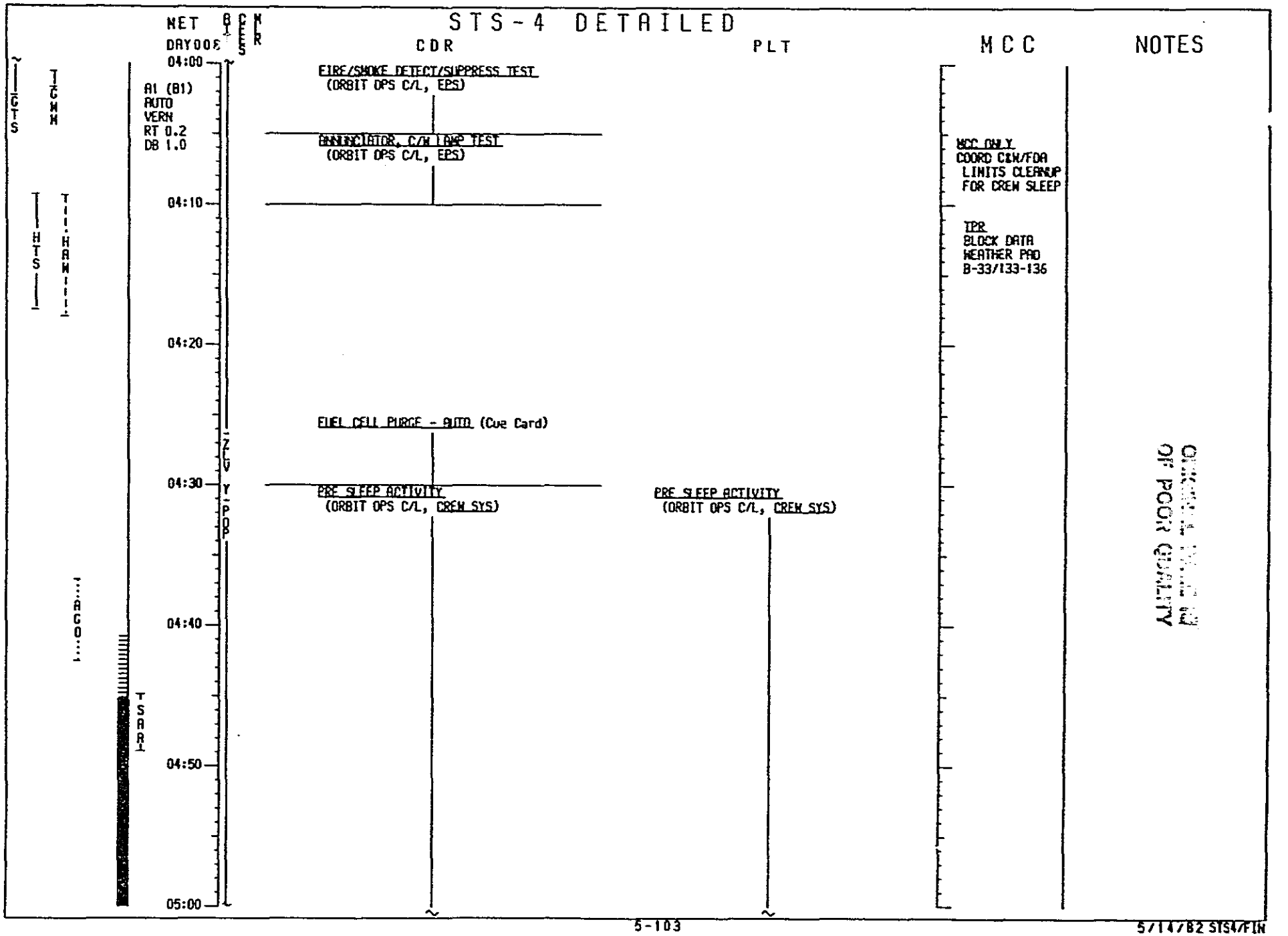

STS-4 DETAILED
MET
DAY008
02:00
02:10
02:20
02:30
02:40
02:50
03:00
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
ORB
130
TDS
GTS
HTS
CDR
PLT
MCC
NOTES
MEAL
MEAL
ASCENDING NODE
ORB: 130
MET: 008:02:09:05
LON: 92.9 E
ORIGINAL PAGE IS
OF POOR QUALITY
5-101
5/14/82

STS-4 DETAILED

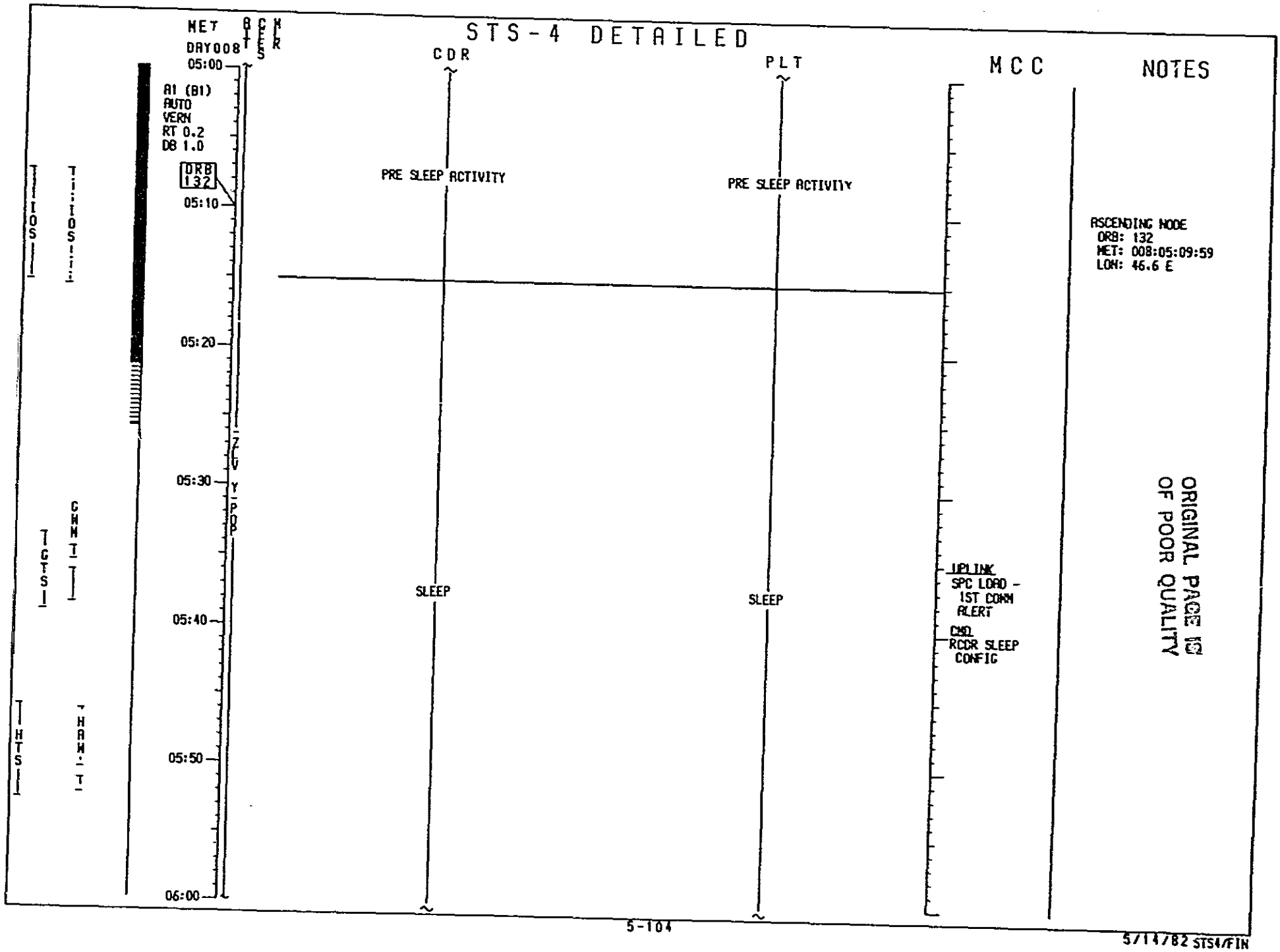


5/14/82 STS4/FIN

STS-4 DETAILED



5/14/82 STS4/FIN


STS-4 DETAILED
MET
DAY008
05:00
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0
DRB
132
05:10
05:20
05:30
05:40
05:50
06:00
CDR
PRE SLEEP ACTIVITY
SLEEP
PLT
PRE SLEEP ACTIVITY
SLEEP
MCC
UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG
NOTES
ASCENDING NODE
ORB: 132
MET: 008:05:09:59
LON: 46.6 E
ORIGINAL PAGE IS
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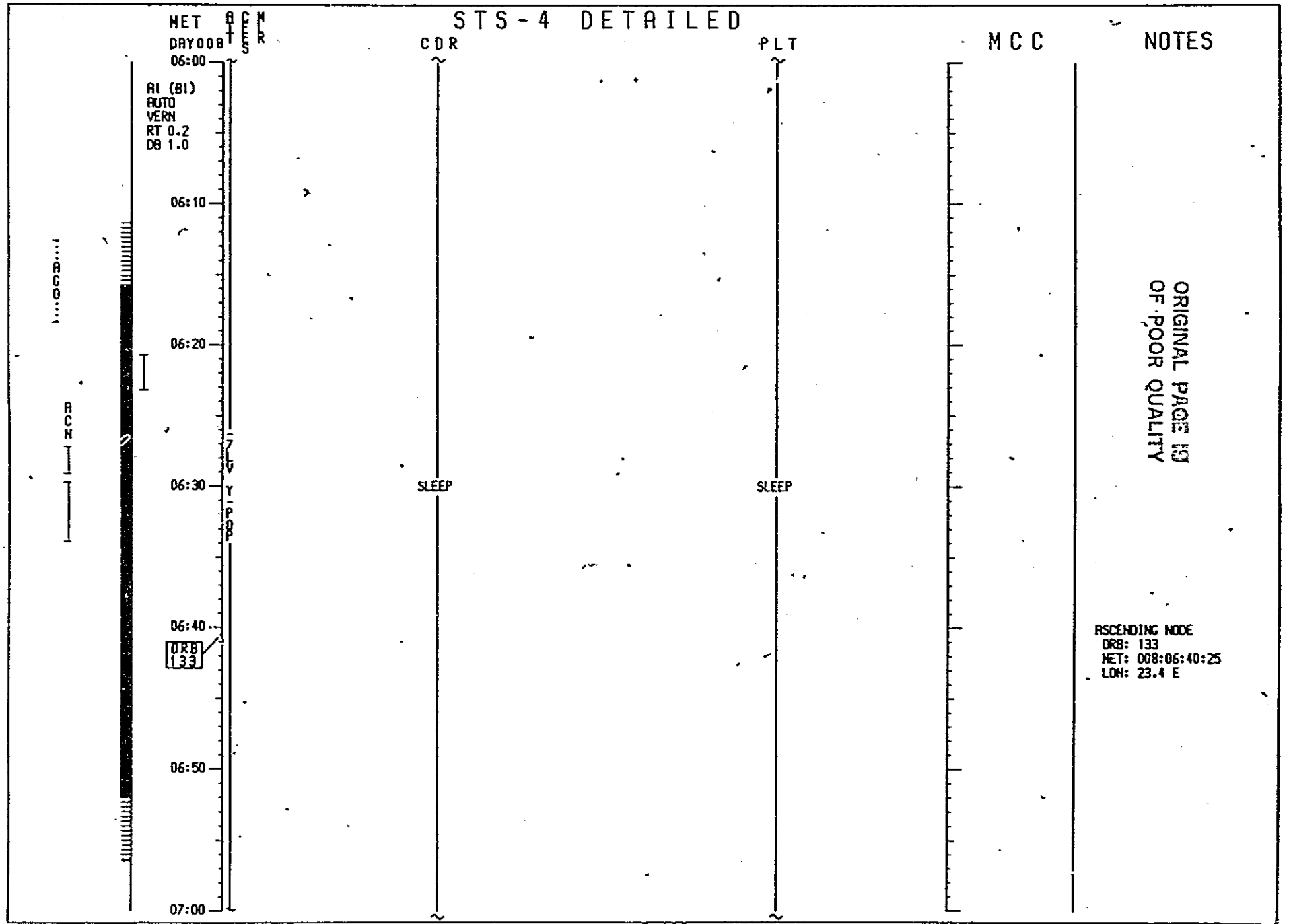
5-104
5/14/82 STS4/FIN

STS-4 DETAILED



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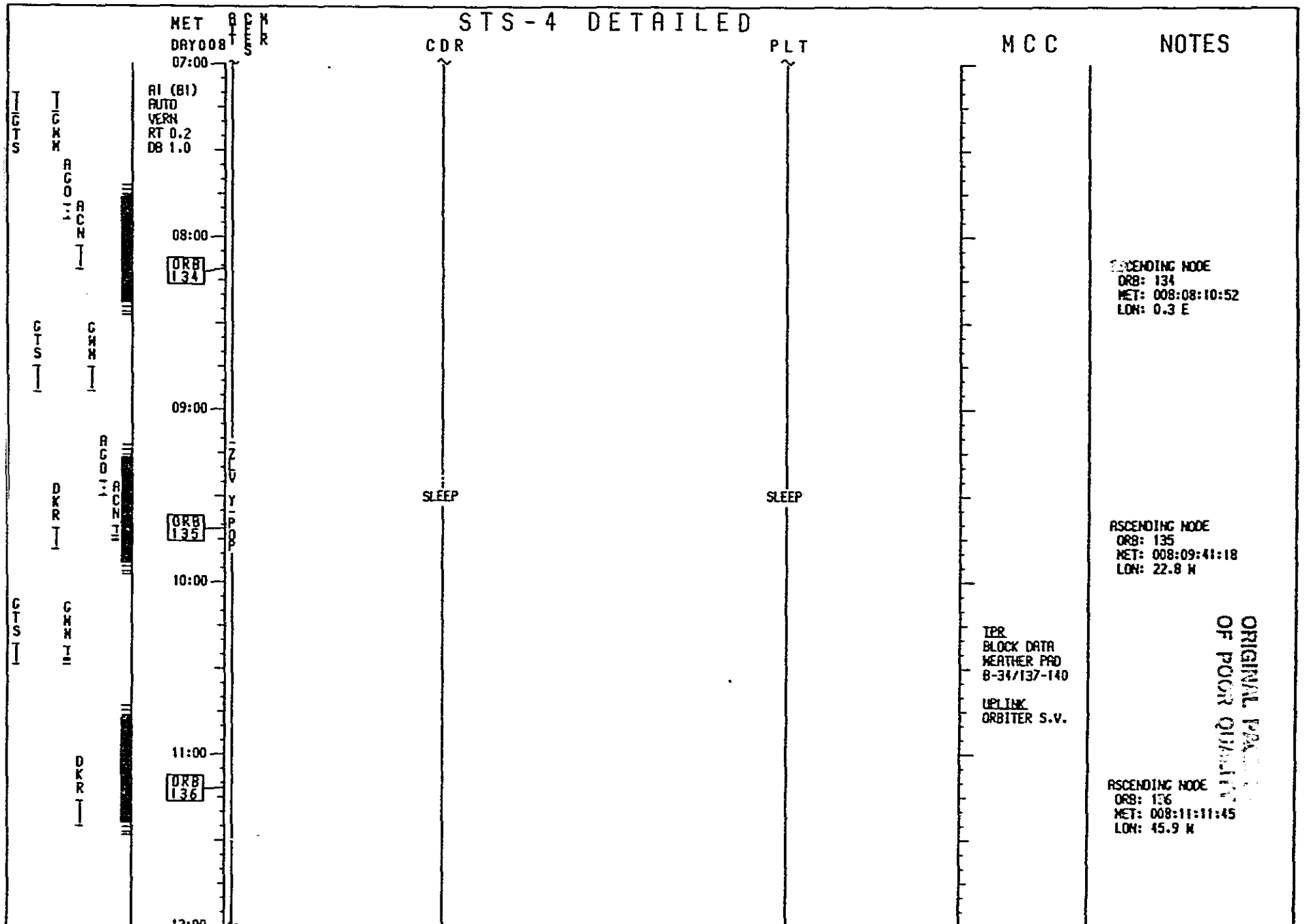
5/14/82 SIS4/FIN

STS-4 DETAILED



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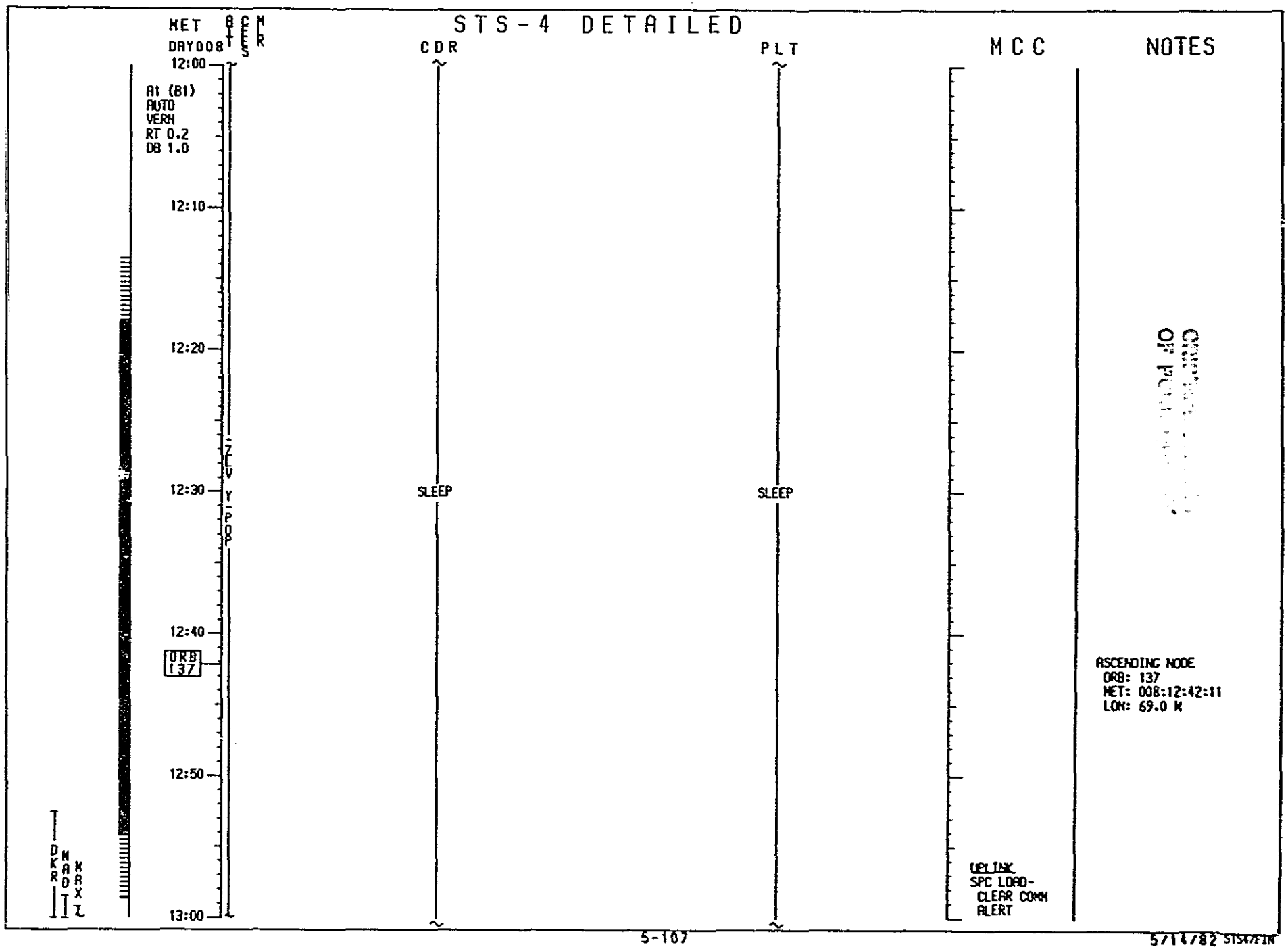
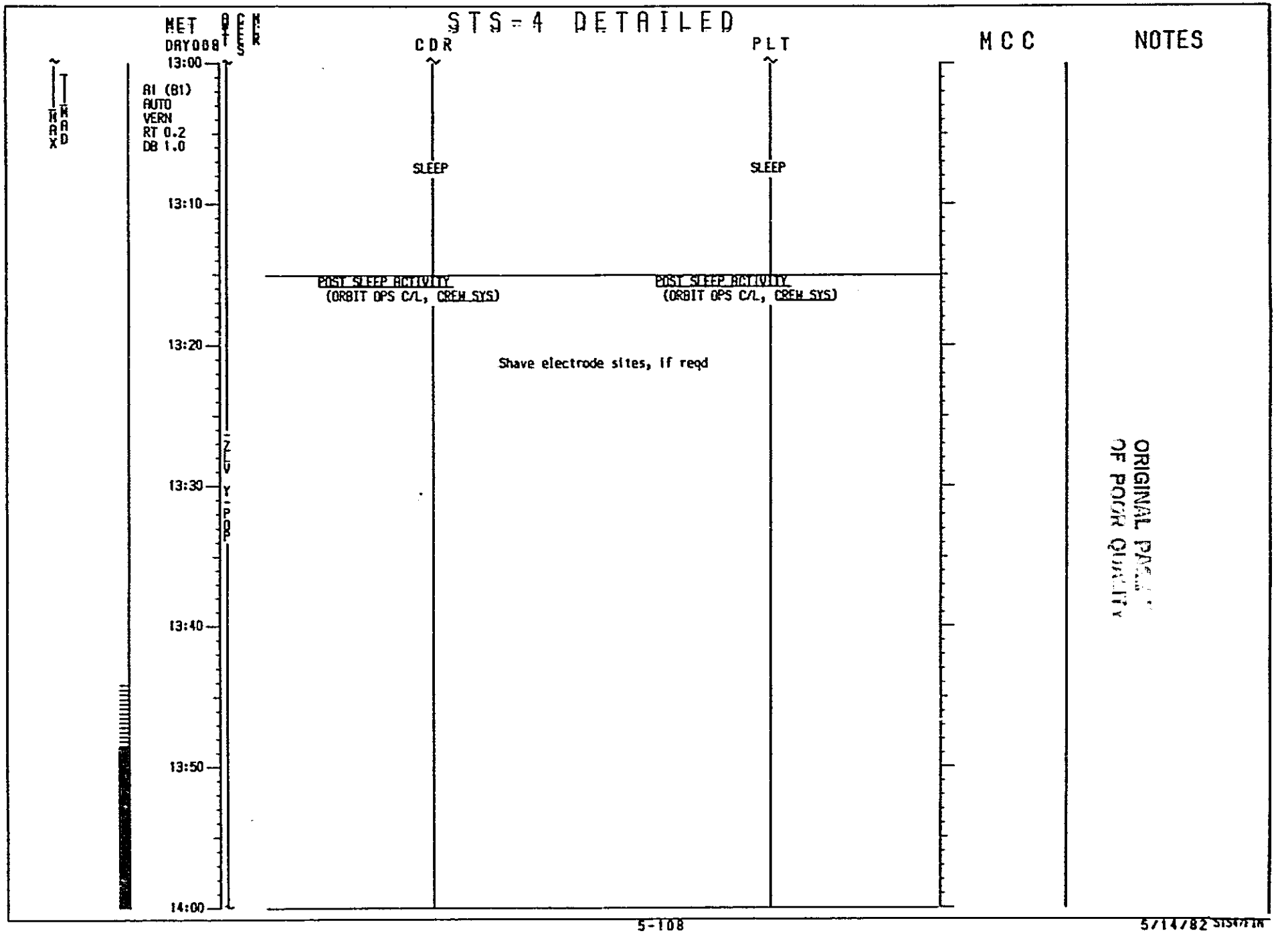
5/14/82 STS4/FIN

STS-4 DETAILED



5/14/82 SISA/FIN



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5/14/82

STS-4 DETAILED

MET DAY008

	CDR	PLT	MCC	NOTES
14:00				
14:10	TELEPRINTER MESSAGE REVIEW	TELEPRINTER MESSAGE REVIEW		
14:20				
14:30				
14:40				
14:50				
15:00				

ORB 138

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

ZLV YPOP

BCR

TDKR I

MAD I

TMAX I

TIOS I

TIOS I

AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R + 46 .6
P + 339 .1
Y + 11 .9
DAP: A/AUTO/VERN
(14:32) Initiate MNVR

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 57, ACRMAR
-Z: 18, CAPELLA
RNG DIF: 91 .7

AUTO MNVR TO -XSI ATT
MNVR OPTION: R + 257 .9
P + 285 .9
Y + 341 .2
DAP: A/AUTO/VERN
(14:55) Initiate MNVR

FUEL CELL PURGE - AUTO (Cue Card)

UPDATE
H2O SPLY DUMP
QTY TK A & B

ASCENDING NODE
ORB: 138
MET: 008:14:12:38
LON: 92.2 W

Stars 57 & 18
available from
8/14:33 to 8/15:11

IMU ALIGN PAD

REQD ID: -Y___ -Z___ RNG ERR___ .___
RNG 1 2 3

+X
( )___.___ ( )___.___ ( )___.___

+Y
( )___.___ ( )___.___ ( )___.___

+Z
( )___.___ ( )___.___ ( )___.___

EXECUTION TIME: ___ / ___:___:___

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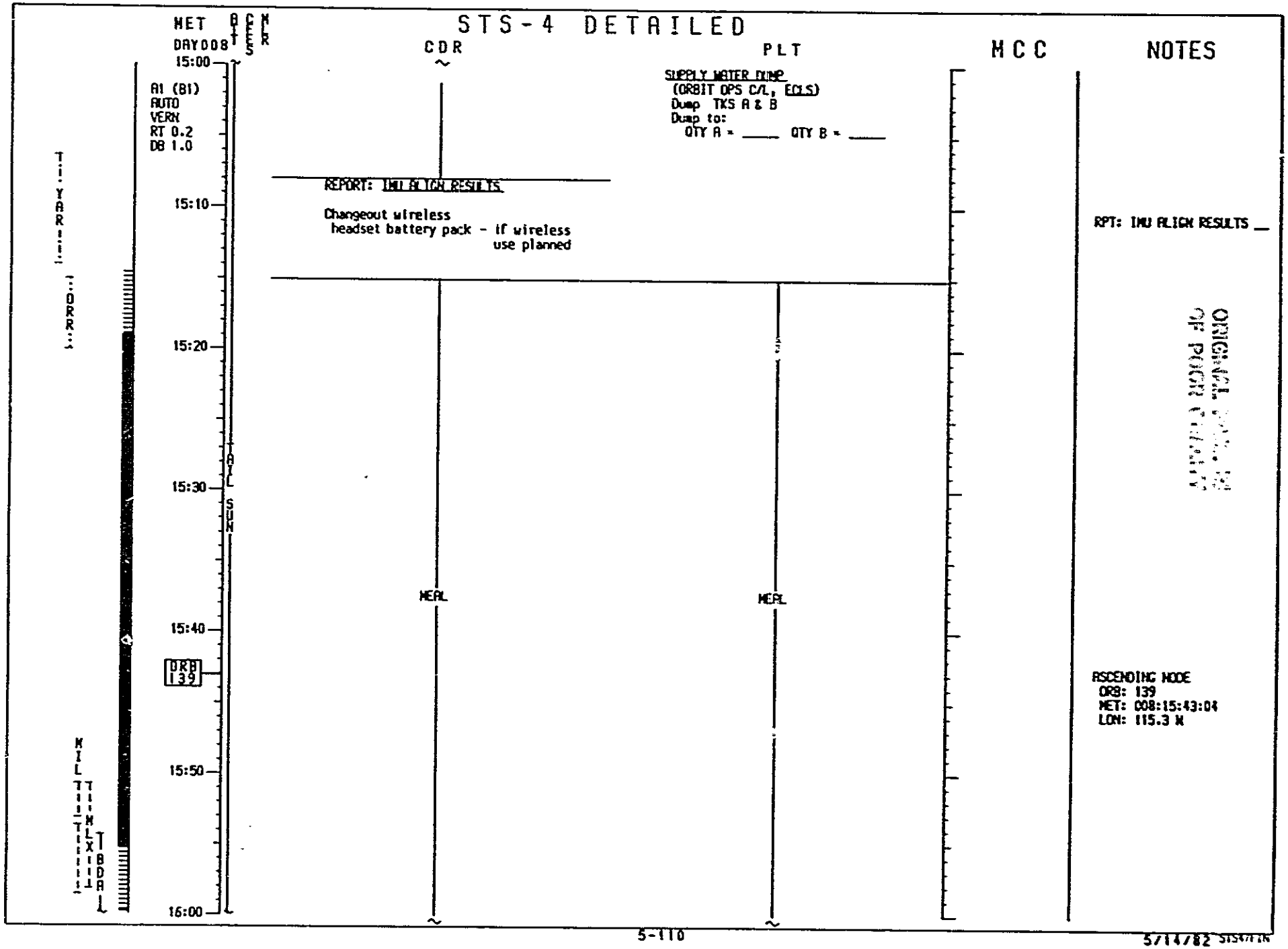
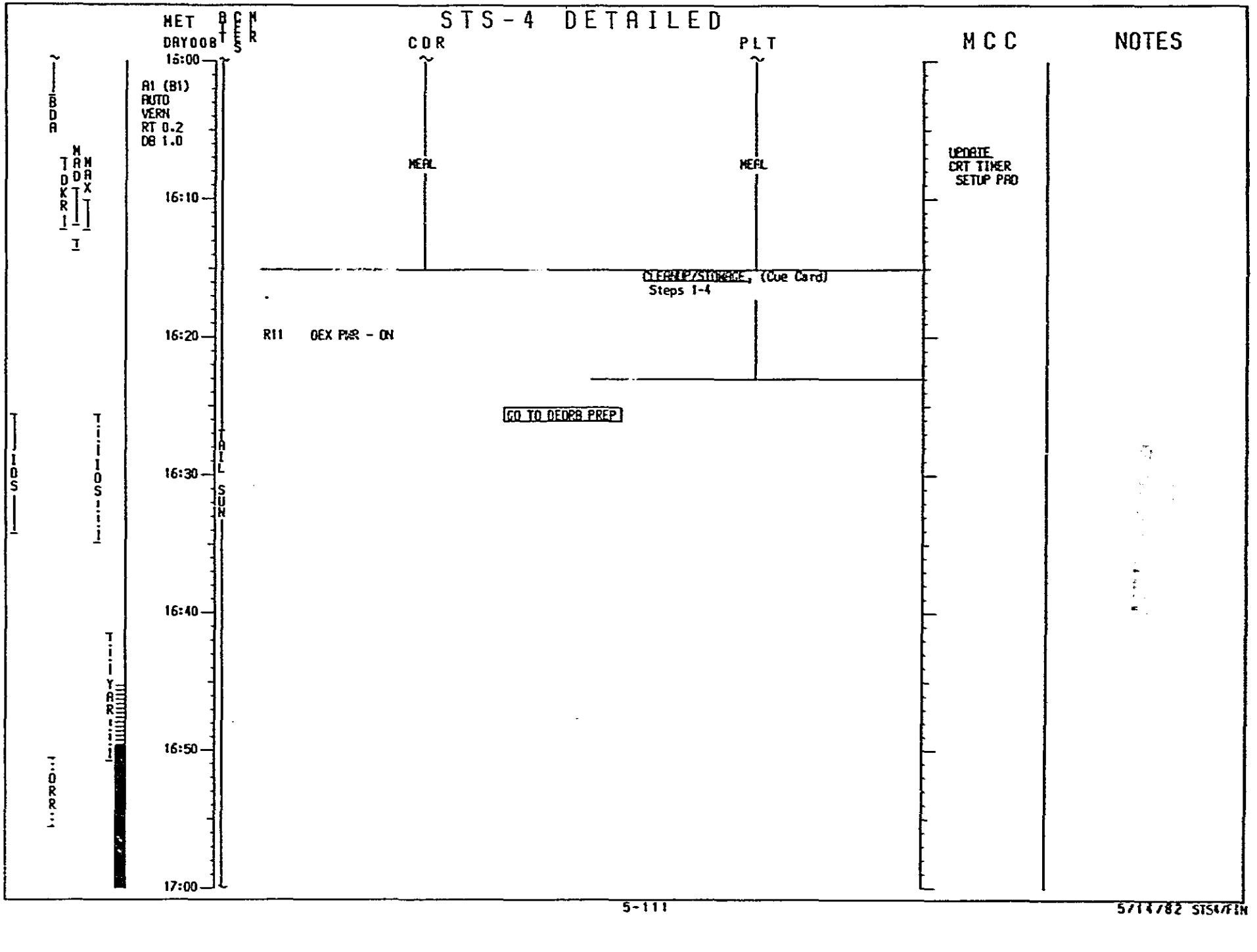
STS-4 DETAILED



5/14/82 SISSTEIN

STS-4 DETAILED



CONSUMABLES CURVES

CREW ACTIVITY PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

CREW ACTIVITY PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION - MAJOR EVENTS

MISSION DURATION (day/hr:min:sec) - 6/23:37:57

LAUNCH (KSC)	June 27, 1982
MET(day/hr:min:sec)	0/00:00:00
Day of Year	178
CDT/GMT	10:00/15:00
MECO	
MET (day/hr:min:sec)	0/00:08:34.08
ORBIT ha/hp (nm)	87 x -10.3
OMS-1	
MET (day/hr:min:sec)	0/00:10:34
ΔV (fps)	162.
ΔT (min:sec)	01:38
ORBIT ha/hp (nm)	129.8 x 34
OMS-2	
MET (day/hr:min:sec)	0/00:37:39
ΔV (fps)	175
ΔT (min:sec)	01:44
ORBIT ha/hp (nm)	130.2 x 129.7
OMS-3	
MET (day/hr:min:sec)	0/04:29:11.6
ΔV (fps)	62.3
ΔT (min:sec)	0:36.7
ORBIT ha/hp (nm)	164.8 x 129.9
OMS-4	
MET (day/hr:min:sec)	0/05:14:12.5
ΔV (fps)	61.6
ΔT (min:sec)	0:36
ORBIT ha/hp (nm)	165.2 x 164.8
DEORBIT	
MET (day/hr:min:sec)	6/22:41:49
ΔV (fps)	315.2
ΔT (min:sec)	2:55
ORBIT ha/hp (nm)	162 x -5
ENTRY INTERFACE	
MET (day/hr:min:sec)	6/23:08:36
LANDING (EDW)	July 4, 1982
MET (day/hr:min:sec)	6/23:37:57
Day of year	185
CDT	09:24

B. CREW

1. Crew designations and responsibilities

   a. Commander (CDR): Prime crewman for launch, entry, aborts and contingency EVA. Responsible for overall command of the vehicle including the safety of both vehicle and crew.

   b. Pilot (PLT): Prime crewman for RMS operations and CFES activities. Responsible for on-orbit management of STS.

2. A typical crew day will be that specified in the STS Work Day Handbook (Ref. 3). The daily on-orbit STS activities and their scheduling constraints are identified in the referenced document.

3. The crew will wear Emergency Ejection Suits (EES) from launch through post-insertion and will don them again for entry. Whenever the EES is worn, OBS sensors are also worn. During the rest of the flight, in-flight garments are worn.

4. For crew sleep periods, the middeck and flight deck speaker boxes will be configured for air-to-ground voice and C&W tones. A level check of the speaker boxes is performed prior to the first sleep period. During sleep the WCCUs will be turned off and stowed.

C. ORBITER SYSTEMS

1. Electrical Power System

   a. A crew-initiated automatic purge of the fuel cells will be scheduled approximately every 12 hours.

   b. The fuel cell purge schedule is shown in Table 9-1.

2. Communications and Instrumentation

   a. The Operational Instrumentation (OI) system will be managed from the ground through uplink commands coordinated with the crew. Exceptions to this would be the result of contingencies. Real-time OI data will be transmitted to MCC during each ground station pass via the S-Band PM downlink. In parallel with this, one of the two operations recorders will dump recorded OI data at a 5-to-1 or 8-to-1 playback-to-record ratio (depending upon whether or not voice is included in the recorded data). One OI recorder will be recording at all times, and the other will dump at every station pass via the S-Band FM downlink. Video downlink causes an exception to this recorder dump plan, but only during the station passes where TV is scheduled as a crew activity.

b. The Development Flight Instrumentation (DFI) system will be crew controlled. The Wideband Ascent Recorder is not used on orbit. The PCM Recorder will be operated during the entire mission in one of three modes: CONTINUOUS RECORD, HI SAMPLE (a 10 second snapshot of data every 5 minutes) and LO SAMPLE (a 10 second snapshot of data every 10 minutes). The Wideband Mission Recorder will be operated in the continuous record mode with all tracks recording in parallel during OMS and RCS burns and as required for FTOs or FSOs. DFI data will be downlinked every ground station pass via a separate S-Band DFI FM downlink. This data will be recorded at the ground station for post-flight shipment to MCC. Recorded DFI data will not be dumped to ground stations during on-orbit operations.

c. There are thirteen (13) GSTDN sites for on-orbit coverage: ORR, BUC, GDS, MIL, BDA, HAW, GWM, AGO, ACN, MAD, YAR, DKR, and BOT, and one (1) SGLS site, IOS. The BUC site does not support data dumps via S-band FM downlink. The IOS site will normally only support S-band PM downlink and down voice for this flight. The site will normally be supporting DOD requirements, but can be configured real time if required to support S-band up voice, PM uplink and FM downlink.

d. Three (3) GSTDN sites can be used for real-time TV: GDS, MIL, and HAW.

e. Nine (9) GSTDN sites and one (1) SGLS site have UHF voice capability: GDS, MIL, BDA, HAW, GWM, ACN, BUC, MAD, DKR, and IOS.

f. Two (2) sites have only UHF voice capability: YAR, and BOT.

g. There are five (5) SGLS sites available for on-orbit coverage: GTS, HTS, NHS, VTS, and IOS. IOS is the only site with voice capability and there is only voice via UHF while supporting DOD requirements.

3. Guidance and Navigation

a. The Orbiter state vector is uplinked about once every three orbits.

b. IMU alignments will be routinely scheduled approximately every twelve (12) hours.

c. Both star trackers are left on continuously except for special tests. A self-test of the star tracker will be performed once a day, normally just prior to the IMU alignment scheduled after the sleep periods.

d. Each IMU will be aligned with different REFSMMATs to provide skewed platforms for enhancement of redundancy management at launch and entry. The launch REFSMMATs have a square root of five skewing and the preferred skew for entry is a square root of six. The REFSMMATs will be changed for entry normally at about 00/03:35 MET. In order to simplify recovery procedures for some contingency cases, one of the IMUs will have the same REFSMMAT for launch and entry. For the case where an IMU fails prior to the switch to the square root of six REFSMMATs, the IMU REFSMMATs, for entry, will be changed to a square root of two skewing to enhance the redundancy management during entry.

e. The on-orbit avionics configuration for STS-4 is listed below. GPC 3 (freeze dried) and GPC 5 (BFS) will be turned off at -0/01:00 MET.

GPCs - 2 RUN (1 GNC, 1 SM), 2 OFF, 1 INTERMITTENT (GNC)
IMUs - 3 OPERATE
STAR TRACKERS - 2 ON
MASS MEMORY UNITS - 2 ON
FLIGHT CRITICAL MDMs - 8 ON

f. The ADI RELMATs provide a means to change the reference system for presenting vehicle attitudes to the crew without having to reposition the IMU platforms. The RELMATs support specific flight phase requirements and are defined as listed below.

1) ASCENT (OPS 1 and 6)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0°, pitch 0°, and yaw 0° when the vehicle is pointed at 0° Right Ascension, 0° Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

This will be a pad-oriented inertial RELMAT with the vehicle +X axis downrange along the first stage launch azimuth and the +Z towards the center of the earth along the launch pad radius vector at the time of lift off. This provides a +X sense ADI ball reading of roll 55.3° (launch azimuth), pitch 90°, and yaw 0° at liftoff.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame in major modes 104, 105, and 106 (i.e., the bias matrix will be an identity matrix). In major modes 101, 102, 103 and 601, the LVIY reference frame will be used.

2) ON-ORBIT (OPS 2 and 8)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^{o}, pitch 0^{o}, and yaw 0^{o} when the vehicle +X axis is pointed at 0^{o} Right Ascension, 0^{o} Declination and the vehicle +Y axis is pointed at the celestial pole.

'REF' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^{o}, pitch 0^{o}, and yaw 0^{o} when the vehicle +X axis is in the direction of the velocity vector and the +Z axis is directed radially down to the center of the earth at the orbital noon time which is closest to the midway MET between TIG for nominal OMS-2 and TIG for nominal deorbit burn.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame (i.e., the bias matrix will be an identity matrix).

3) ENTRY (OPS 3)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^{o}, pitch 0^{o}, and yaw 0^{o} when the vehicle is pointed at 0^{o} Right Ascension, 0^{o} Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

Same as 'INRTL' position.

'LVLH' Position:

Unbiased.

g. The OPS-2 I-loaded DAP configuration is currently planned to be:

	DAP A	DAP B
Translation Pulse	0.1	0.02
Rotation Discrete Rate - NORM	0.2°/sec	0.5°/sec
- VERNIERS	0.2°/sec	0.2°/sec
Rotation Pulse - NORM	0.1	0.04
- VERNIERS	0.01	0.002
Rotation Compensation - NORM	0.0	0.0
- VERNIERS	0.0	0.0
Attitude Deadband (R,P,Y axis)		
- NORM	5.0°	3.0°
- VERNIERS	1.0°	1.0°
Rate Deadband - NORM	0.2°/sec	0.2°/sec
- VERNIERS	0.02°/sec	0.02°/sec
Jet Opt Pitch	1	1
Yaw	1	1
Cntl Accel	0	0

h. The OPS-3 Transition DAP configuration is:

Rotation Discrete Rate	0.2°/sec
Attitude Deadband	3.5°
Rate Deadband	0.3°/sec

4. Propulsion

The major burns maneuver schedule for STS-4 is identified in Section 7.A, FLIGHT DESCRIPTION - MAJOR EVENTS.

5. Environmental Control and Life Support Subsystem (ECLS)

a. The CO2 absorbers are not installed for launch or entry. Both canisters are initially installed at approximately 0/05:20 MET and are then alternately replaced with new canisters within the required frequency of approximately every 24 hours. The canisters are both removed approximately 4 hours prior to the deorbit burn ignition during the deorbit preparations on entry day. The installation/replacement schedule is shown in Table 9-3.

b. The waste water tank will be loaded to 40% at launch, with sufficient ullage volume to accommodate waste water accumulation during the flight. The tank will be as full as feasible at the planned end of the mission.

c. The supply water tanks will be sufficiently loaded at launch so that planned launch day deorbit opportunities can be supported through the use of combined supply and waste water, without opening the payload bay doors. Thus all tanks will be full at launch except Tank A which will be 45% full. This allows sufficient ullage to handle fuel cell water production during the ascent phase. Potential supply water dumps are scheduled approximately every 12 hours in the Crew Activity Plan which may or may not be required. A real-time call will be made prior to each

scheduled dump to inform the crew if a dump is required and to what level. Tanks A & B will be dumped to a level that will allow the tanks to be full prior to the next daily group of EDW deorbit opportunities. The supply water dump schedule is shown in Table 9-2.

D. INTERIM TELEPRINTER SYSTEM (ITS)

1. The Interim Teleprinter System (ITS) will be used for STS-4. The system will provide an on-orbit capability to receive and reproduce text data (such as procedures and CAP updates or changes) from the MCC during routine and off-nominal situations.

2. The teleprinter is located on the middeck in a standard flight locker (MA9F) adjacent to Avionics Bay 3A. Foam insulation inside the locker is used to reduce the noise from the teleprinter during operation.

E. TELEVISION/PHOTOGRAPHY

1. The Closed Circuit Television (CCTV) system will be used for STS-4. This system provides two cameras for in-cabin coverage and two RMS and four payload bay TV cameras for coverage of payload bay activities. The system, after activation, can be managed by ground commands during live coverage passes. For TV coverage outside of STDN coverage, the crew must manage the CCTV system.

2. There is a video tape recorder (VTR) available to record video during periods when there is no STDN coverage. The video is recorded on 30-minute cassettes and will normally not be dumped to the ground. Recorded video can be dumped to the ground if desired since the VTR output (dump) currently is hooked to the PL1 video input, allowing recorded video to be played back into the Orbiter communication system as if it were a PL1 (Spacelab) TV camera input. VTR management must be performed by the crew.

3. 16mm, 35mm, and 70mm camera systems are available.

F. REMOTE MANIPULATOR SYSTEM (RMS)

1. OMS/RCS CONSTRAINTS

a. VRCS - No constraints during RMS OPS

b. PRCS - Constraints during Loaded and Unloaded RMS OPS:

1. Usage not permitted under the following conditions:

a. RMS JOINT in a Singularity
b. RMS at a Reach Limit
c. RMS in Test Mode
d. During EE OPS
e. Loaded RMS/PRCS Interaction Test will be NO GO for Failed VRCS.

2. Must be on Tail Only Jets with a 3° deadband when on AUTO DAP.

c. OMS - Usage not permitted with RMS uncradled or attached to a berthed Payload.

2. No part of the RMS shall be positioned within the following distances of an RCS Thruster:

   a. PRCS - 15 ft
   b. VRCS - 3 ft

3. No part of the RMS/Payload/End Effector will be maneuvered outside the Crew/CCTV field of view, unless the joint angles and sequence to be maneuvered have been verified as acceptable.

G. PAYLOADS

1. IECM (Induced Environmental Contamination Monitor)

   The crew will be required to operate the IECM switch on Panel R11 four times during the flight. These switch operations, which mode the IECM mass spectrometer, are performed after payload bay door openings, for plume impingement, contamination mapping, and gas release maneuver FTOs, per the STS-4 Flight Requirements Document (Ref. 1). The IECM mass spectrometer must be turned off when the payload bay doors are closed to prevent damage to the mass spectrometer by pressure buildup in the payload bay.

2. MLR (Monodisperse Latex Reactor)

   The MLR is activated via a single switch prior to the first crew sleep period and runs continuously for 19.5 hours. The experiment occupies the space of three middeck lockers.

3. CFES (Continuous Flow Electrophoresis System)

   The CFES provides a processing system which can segregate biological samples using a separation process based on the relative motion of charged particles through an electric field (electrophoresis). For STS-4, the crew will be required to operate the payload twice during the early portion of the flight. Each operating period lasts approximately eight hours. The PLT has been designated as the prime crewman for CFES operations. The CFES payload is located on the Orbiter middeck. A low acceleration level is desired during CFES operations.

4. GAS (Get-Away Special)

   The GAS payload is a self-contained experiment package that requires minimal crew activity. After the crew is given approval for orbit operations, the crew unstows a handheld controller and activates the payload. Once activated, an internal controller sequentially initiates the biological, materials processing, and physical science experiments at the appropriate time. The experiments do not require any special attitudes during their operation. Deactivation and stowing of the handheld controller occur before deorbit preparation.

5. NOSL (Night/Day Optical Survey of Thunderstorm Lightning)

The NOSL experiment is performed in the Orbiter cabin. The experiment requires crew operations for unstowing and setting up in the aft flight deck, for on-orbit operations using targets of opportunity, and for stowage. A -ZLV attitude is desired for taking data.

ON-ORBIT CREW ACTIVITY
FUNCTIONAL TEST OBJECTIVES (FTOs), FUNCTIONAL SUPPLEMENTARY OBJECTIVES (FSOs)

INTRODUCTION

The following Table describes the scheduling data and rationale for on-orbit crew activity related FTOs/FSOs for STS-4. The current FRD (Ref. 1) was used for compiling this table.

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
401-01	Ascent Performance Data Collection	N/A	No crew interaction required except for DFI recorder configurations
402-01	SRB Performance Data Collection		
403-01	On-Orbit Performance Data Collection		
404-01	Entry/Approach and Landing Performance Data		
411-01	Structural Conditioning	PTC initiated at 06/04:52	Ground will provide go/no-go for crew thermal conditioning
412-01	Attitude Hold Thermal Response	1/07:49 - 1/19:12 1/23:18 - 4/18:18 4/19:24 - 6/04:32 6/04:52 - 6/16:02	PTC -XSI (Tail To Sun) +ZSI (Bottom to Sun) PTC
412-02	Startracker Coldsoak Thermal Response	2/04:15 - 2/18:54 2/18:54	Both startrackers powered off Both startrackers powered on Both startrackers powered off for ~12 hours followed by ~12 hours of both startrackers powered on. A startracker self-test and a normal IMU alignment will be performed between the two periods

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
412-03	Supply Water Dump Line and Nozzle Thermal Response		Has been deleted
412-04	Waste Water Dump Line and Nozzle Thermal Response		Has been deleted
412-05	FRCS Thermal Soakback, One Forward Engine	4/15:40 - 5/00:10	Performed after 20 hours of -XSI or anytime after start of -XSI. Inhibit 3 FRCS engines for 5 hours; fire F3F for 30 seconds; inhibit all 3 engines for 5 hours
412-06	FRCS Thermal Soakback, Two Forward Engines	5/22:41 - 6/04:24	Performed no earlier than 20 hours after initiation of -XSI thermal test period. Requires inhibiting 3 FRCS engines for 5 hours, subsequent firing of 2 of the 3 engines for 30 seconds, and a final 5-hour period of inhibiting of all 3 engines prior to return to normal operations.
412-07	FRCS Thermal Soakback, Pulse Mode	3/16:00 - 4/02:50	Performed after 20 hours in either -XSI or +ZSI; inhibit 3 FRCS engines for 5 hours; perform five 30-second firings of F3F (each firing separated by 30 minutes); inhibit all 3 engines for 5 hours
412-08	ARCS Thermal Soakback, One Aft Engine	5/22:41 - 6/04:24	Performed after 20 hours of +ZSI; inhibit aft firing PRCS engines and VRCS engines in port pod; fire L1A for 100 seconds; inhibit engines involved for 5 hours

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
413-01	ET Passive Ablation Sensor Target Photography	8 seconds after ET SEP	
421-01	Early Entry Roll Characteristics	Q = 22.0 psf	
421-02	Aerothermodynamics/ Performance	V = 21,000 fps	
421-03	Aerothermodynamics/ Performance	V = 18,000 fps	
421-04	Aerothermodynamics/ Performance	V = 14,000 fps	
421-05	Aerothermodynamics/ Performance	V = 8,400 fps	
421-06	Supersonic Lateral Trim	M = 3.2	
421-07	Transonic Lateral/ Directional Stability		Has been deleted
421-08	Wing and Tail Excitation (Structural PTI)	M = 2.2	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
431-01	Window Observation and Reporting		Has been deleted
432-01	Ascent Wing and Tail Excitation	V = 460 fps	
433-01	Payload Bay Liner Performance	0/02:55	
434-01	Flight Debris Investigation	0/02:57	
441-01	Vacuum Inerting	Between OMS 1&2	The inerting is terminated prior to the OMS-2 burn
441-02	Inerting Verification	0/05:20 - 0/05:52	Between 6 and 12 hours after completion of FTO 441-01
442-01	Simulated OMS Engine Failure (OMS-3)		Has been deleted
444-01	Hydraulic System Warm-up	During FCS C/O on FD5	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
445-01	PRSD Stratification Test, 85% Level	Not Scheduled	
445-02	PRSD Stratification Test, 50% Level	Not Scheduled	
445-03	PRSD Stratification Test, 15% Level	5/22:20 - 5/22:30	Provide cryo supply with 15% density to all 3 FCPs. Configure electrical loads for 19.3 kW split among 3 FCPs and maintain for 2 hours. Plus and then minus pitch maneuvers of 175° at 1°/sec performed
451-01	PLBD Initial Alignment Test		Has been deleted
451-02	PLBD Final Alignment Test		Has been deleted
451-03	PLBD Cold Case Performance	4/16:50 - 4/18:10	Performed as near the end of the -XSI thermal test period as practicable based on operational requirements. Theodolite must be installed. Calibration sightings required during initial PLBD operations
451-04	PLBD Thermal Gradient Performance	6/00:50 - 6/02:10	Performed as near the end of the +ZSI thermal test period as practicable based on operational requirements

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
452-01	RMS Software Stop Performance		Has been deleted
452-02	Singularity Management	5/02:00 - 5/02:35	
452-03	Unloaded Arm Response to PRCS	5/01:18 - 5/01:58	
453-01	Contamination Mapping	1/20:20 - 1/22:50	IECM limited to 4 hours of operations after switching to internal battery power
454-01	RCS Plume Flow Field Measurement	2/01:10 - 2/03:10	IECM limited to 4 hours of operations after switching to internal battery power
455-01	Payload Deployment and Berthing Performance	1/20:10 - 1/23:15 2/01:00 - 2/03:30	
455-02	RMS/PRCS Interactions	Shopping List Item	
461-01	Whole Gas Samples	6/03:20	
461-03	ATCO Performance Evaluation	N/A	No crew interaction required

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
462-01	Radiator Coating Bond Verification	5/00:48 - 5/01:18	
466-01	Radiator Performance Test	0/02:20 - 0/08:00 1/06:55 - 1/23:25 2/20:05 - 2/22:54 5/20:20 - 6/01:30	Desired to perform this test during the following attitudes: -ZLV; -ZSI; -XSI or +XSI; PTC; +ZSI; Gravity Gradient
467-01	VPC Freezer Heat Exchanger Dynamics	0/23:50 - 1/07:50	Freezer should have been off at least six (6) hours
467-02	Long Term VPC Freezer Temperature Stability	1/23:45 - 1/23:50 3/02:15 - 3/02:20 4/05:30 - 4/05:35 5/05:35 - 5/05:40 5/22:55 - 5/23:00	
467-03	Sample Freezing Storing and Return	1/07:50 - 1/07:56	FTO 467-01 must be accomplished before this FTO
471-01	S-Band and UHF Antenna Patterns	6/05:20 - 6/05:40	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
472-01	Autoland Controlled Approach	N/A	
472-02	Crosswind Landing Performance	N/A	
473-01	Startracker Operation During Water Dumps	1/07:23 - 1/07:43	Daylight required
473-03	Forward Station COAS Calibration	0/08:24 - 0/08:29	
474-01	Navigation Base Stability	1/19:31 - 1/19:50 4/18:30 - 4/18:50	
475-01	Cold Case CCTV Evaluation, Non-Operating		Has been deleted
475-02	Cold Case CCTV Evaluation, Operating		Has been deleted
476-01	Backup Orbital Navigation	3/04:19 - 3/04:37 5/18:14 - 5/18:34 5/19:42 - 5/20:04	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO/FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
477-01	PRCS Narrow Deadband Attitude Hold Performance	3/23:20 - 3/23:25	
477-02	Passive Gravity Gradient Attitude Hold	0/06:05 - 0/07:56 0/19:15 - 1/06:52	
479-01	On-Orbit TACAN Nav Aid Capability	2/19:35 - 3/00:37 3/23:40 - 4:00:10 4/00:53 - 4/02:43	GPC must be in OPS 8 during data collection
S401-01	Tile Gap Heating Data Collection	N/A	
S402-01	Catalytic Surface Effects Data Collection	N/A	
S403-01	Dynamic, Acoustic and Thermal Environment Data	N/A	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S431-01	IECM Operation	Post Insertion 4/23:05 - 4/23:50 Deorbit Prep	IECM switch is in POS 2 at launch; at four (4) defined times during the flight, the crew places the IECM switch in POS 1 position for 30 ±5 seconds and then back to POS 2 position
S432-01	Infrared Imagery of Shuttle	N/A	
S433-01	Prelaunch and Ascent ACIP Data Operation	Prelaunch & Ascent	
S433-02	Quiescent On-Orbit Data Collection	1/03:18 - 1/03:24	Gravity gradient required
S433-03	Deorbit Through Landing ACIP Data Collection	Deorbit and Entry	
S434-01	Deploy Radiation Dosimeter Pouches	N/A	
S434-02	Stow Radiation Dosimeter Pouches	N/A	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S435-01	GAS Operation	0/05:25 - 6/00:00	
S436-01	CFES Operation	0/20:25 - 1/04:15 2/19:45 - 3/04:09	Experiment run #1 Experiment run #2
S441-01	NOSL Operations	0/21:50 - 6/05:05	
S442-01	MLR Operation	0/06:30 - 1/02:15	Low acceleration level desired for 19.5 hours
S443-01	In-flight Motion Sickness Data Collection	0/08:45 1/08:15 2/07:25 3/06:15 4/05:55 5/05:55 6/05:55	
S491-01	Crew Activities TV	1/01:24 - 1/01:32 3/01:40 - 3/02:10 3/19:15 - 3/19:25 4/22:51 - 4/23:00 5/20:07 - 5/20:16	Group 2

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S491-02	IECM Handling Demonstration TV	2/01:10 - 2/03:10	Group 2
S491-03	Activities of Opportunity TV	TBD	Group 2
S491-04	TV of the CDR	3/19:15 - 3/19:25	Group 1
S491-05	TV of the PLT	1/01:24 - 1/01:32 3/01:40 - 3/02:10 4/22:51 - 4/23:00 5/20:07 - 5/20:16	Group 1
S492-01	Launch Photography (16mm)	Ascent	Group 1
S492-02	Crew Activities (16mm)	1/01:50 - 1/04:15 2/02:38 - 2/21:25 4/00:11 - 4/00:16 4/01:30 - 4/02:12 4/16:50 - 4/18:10	Group 2
S492-03	Payload Bay Photography (16mm)	1/20:20 - 1/22:55	Group 1, associated with RMS/IECM OPS
S492-04	Unscheduled Photography (16mm)	TBD	Group 2

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S492-05	Approach and Landing Photography (16mm)	Entry	Group 1
S492-06	Photography of the CDR (16mm)	2/20:38 - 2/21:25	Group 2
S492-07	Photography of the PLT (16mm)	4/00:11 - 4/00:16	Group 2
S493-01	Crew Activity Photography (35mm)	TBD	Group 2
S493-02	Payload Bay Photography (35mm)	TBD	Group 2
S493-03	On-Orbit Photography (35mm)	TBD	Group 2
S493-04	Still Photography of the CDR (35mm)	TBD	
S493-05	Still Photography of the PLT (35mm)	TBD	

TABLES

TABLE 9-1
ORBITER FUEL CELL PURGES

APPROX MET (D/HH:MM)	FUEL CELL PURGE NO.	FUEL CELL PURGE Δt (HH:MM)
Post-Ins (0/02:52)	1	
0/08:40	2	04:48
0/18:30	3	09:50
1/08:10	4	13:40
1/18:00	5	09:50
2/07:15	6	13:15
2/17:15	7	10:00
3/06:05	8	12:50
3/16:10	9	10:05
4/05:50	10	13:40
4/15:40	11	09:50
5/05:50	12	14:10
5/15:45	13	09:55
6/05:50	14	14:05
6/16:20	15	10:30
Deorbit Prep (6/20:33)	16	05:53

TABLE 9-2
ORBITER WATER DUMPS (SUPPLY)

APPROX MET (D/HH:MM)	SUPPLY H2O NO.	SUPPLY H2O Δt (HH:MM)
0/07:44	1	
0/17:55	2	10:11
1/07:24	3	13:29
1/18:00	4	10:36
2/05:50	5	11:50
2/17:10	6	11:20
3/04:45	7	11:35
3/16:05	8	11:20
4/03:05	9	11:00
4/19:05	10	16:00
5/03:10	11	08:05
5/15:55	12	12:45
6/02:10	13	10:15
6/16:25	14	14:15

TABLE 9-3
CO2 ABSORBER REPLACEMENT

APPROX MET (D/HH:MM)	CO2 ABSORBER REPLACEMENT			
	ABSORBER NO.	POSITION	POSITION A Δt (HH:MM)	POSITION B Δt (HH:MM)
* 0/05:20	1 & 2	A & B		
** 0/08:35	3	A	03:15	
1/08:10	4	B		26:50
2/07:20	5	A	46:45	
3/06:00	6	B		45:50
4/05:35	7	A	46:15	
5/05:40	8	B		47:40
6/05:40	9	A	48:05	
***6/17:50			13:50	37:15

*INITIAL INSTALLATION OF BOTH CO2 ABSORBERS
**CO2 ABSORBER NO 1 IS REWRAPPED AND SAVED FOR CONTINGENCY
***BOTH CO2 ABSORBERS REMOVED FOR ENTRY

TABLE 9-4
CRYO MANAGEMENT

	MET	O2/H2 TANK HTRS SWITCH CONFIGURATION
POST INSERTION	0/03:00 (STATUS AS OF)	O2 TK1 & 2 HTRS A,B (four) - AUTO H2 TK1 & 2 HTRS A,B (four) - AUTO O2 TK3 HTRS (two) - AUTO H2 TK3 HTRS (two) - AUTO O2 TK4 HTRS (two) - OFF H2 TK4 HTRS (two) - OFF
PREP (PRSD TEST)	5/15:50	O2 TK1,2,3,4 HTRS (all) - OFF H2 TK1,2,3,4 HTRS (all) - OFF
POWERUP (PRSD TEST)	5/19:53	O2,H2 TK4 HTRS A (two) - AUTO
PERFORMANCE (PRSD TEST)	5/22:20	
POST (PRSD TEST)	5/22:35	O2 TK1 & 2 HTRS A (two) - AUTO H2 TK1 & 2 HTRS A,B (four) - AUTO O2,H2 TK3 HTRS A (two) - AUTO O2,H2 TK4 HTRS A (two) - OFF

TABLE 9-5 - DFI WIDEBAND ASCENT RECORDER USAGE

APPROX MET (DD/HH:MM:SS)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (MM:SS)	TAPE REMAINING (MM:SS)	P*
~-00/00:05:30	CONT	ON	--	00:00	32:00	T
00/00:13:00	STBY	ON	18:30	18:30	13:30	B
00/00:35:00	CONT	ON	00:00	18:30	13:30	S
00/00:39:00	STBY	ON	04:00	22:30	9:30	
00/01:05:00	STBY	OFF	04:00	22:30	9:30	

*Data Priority based from 10 down to 1 (OI Data is 10)

TABLE 9-6 - DFI WIDEBAND MISSION RECORDER USAGE

APPROX MET (DD/HH:MM)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
-00/00:06	CONT	ON	--	00:00:00	02:00:00	LAUNCH THRU OMS 1	T
00/00:13	STBY	ON	19:00	00:19:00	01:41:00		B
00/00:35	CONT	ON	00:00	00:19:00		OMS 2	S
00/00:39	STBY	ON	04:00	00:23:00	01:37:00		
00/01:05	STBY	OFF					
00/04:27	CONT	ON	00:00	00:23:00		OMS 3	
00/04:31	STBY	OFF	04:00	00:27:00	01:33:00		
00/05:12	CONT	ON	00:00	00:27:00		OMS 4	
00/05:16	STBY	OFF	04:00	00:31:00	01:29:00		
01/03:16	STBY	ON	00:00	00:31:00	01:29:00		
01/03:20	CONT	ON	00:00	00:31:00	01:29:00	ACIP ON-ORBIT TEST	
01/03:21	STBY	ON	01:00	00:32:00	01:28:00		
01/03:26	STBY	OFF	00:00	00:32:00	01:28:00		
03/18:48	CONT	ON	00:00	00:31:00		F3F PULSE MODE TEST	
03/18:52	STBY	OFF	04:00	00:36:00	01:24:00		
03/19:18	CONT	ON	00:00	00:36:00		F3F PULSE MODE TEST	
03/19:22	STBY	OFF	04:00	00:40:00	01:20:00		
03/19:48	CONT	ON	00:00	00:40:00		F3F PULSE MODE TEST	
03/19:52	STBY	OFF	04:00	00:44:00	01:16:00		
03/20:18	CONT	ON	00:00	00:44:00		F3F PULSE MODE TEST	
03/20:22	STBY	OFF	04:00	00:48:00	01:12:00		
03/20:48	CONT	ON	00:00	00:48:00		F3F PULSE MODE TEST	
03/20:52	STBY	OFF	04:00	00:52:00	01:08:00		
04/19:13	CONT	ON	00:00	00:52:00		RCS TEST, 1 FWD ENG	
04/19:17	STBY	OFF	04:00	00:56:00	01:04:00		
05/22:44	CONT	ON	00:00	00:56:00		RCS TEST, 2 FWD/1 AFT ENG	

*Data Priority based from 10 down to 1 (OI Data is 10)
**Time of 2 min sample should correspond to the approximate time sleep station readings are taken

TABLE 9-6 - DFI WIDEBAND MISSION RECORDER USAGE (CONTINUED)

APPROX MET (DD/HH:MM)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
05/22:48	STBY	OFF	04:00	01:00:00	01:00:00		
06/18:00	CONT	ON	00:00			WB CAL	
06/18:01	STBY	OFF	01:00	01:01:00	00:59:00		
06/22:40	CONT	ON	00:00	01:01:00		DEORBIT BURN	
06/22:46	STBY	OFF	06:00	01:07:00	00:53:00		
06/23:06	CONT	ON	00:00	01:07:00		EI-3 THRU ROLLOUT	
06/23:39	STBY	OFF	46:00	01:53:00	00:07:00		

*Data Priority based from 10 down to 1 (OI Data is 10)
**Time of 2 min sample should correspond to the approximate time sleep station readings are taken

TABLE 9-7 - DFI PCM RECORDER USAGE

APPROX MET (DD/HH:MM)	MODE	Δt (HH:MM)	Δt TAPE** USAGE (HH:MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
-00/00:06	CONT	--	--	--	05:52:00	ASCENT THRU VAC INERT +5	T
00/00:23	HI SAMP	00:29	29:00	00:29:00	05:23:00	RA	B
00/00:35	CONT	00:12	00:22	00:29:22	05:22:38	OMS 2	S
00/00:39	LO SAMP	00:04	04:00	00:33:22	05:18:38		
00/01:59	CONT	01:20	01:17	00:34:39	05:17:21	PLBD OPENING	
00/02:02	LO SAMP	00:03	03:00	00:37:39	05:14:21	NOMINAL CONFIG	
00/04:27	CONT	02:25	02:34	00:40:13	05:11:47	OMS 3 BURN	
00/04:31	LO SAMP	00:04	04:00	00:44:13	05:07:47	NOMINAL CONFIG	
00/05:12	CONT	00:41	00:44	00:44:57	05:07:03	OMS 4 BURN	
00/05:16	LO SAMP	00:04	04:00	00:48:57	05:03:03	NOMINAL CONFIG	
00/05:22	CONT***	00:06	00:00	00:48:57	05:03:03	INERTING VERIFICATION	
00/05:27	HI SAMP***	00:05	05:00	00:53:57	04:58:03	INERTING VERIFICATION	
00/05:52	LO SAMP	00:25	00:44	00:54:41	04:57:19	NOMINAL CONFIG	
01/20:20	HI SAMP	38:28	41:26	01:36:07	04:15:53	IECM CONTAM MAPPING	
01/22:55	LO SAMP	02:35	05:19	01:41:26	04:10:34	NOMINAL CONFIG	
03/18:48	CONT	43:53	47:18	02:28:44	03:23:16	F3F PULSE MODE TEST	
03/19:00	HI SAMP	00:12	12:00	02:40:44	03:11:16	F3F PULSE MODE TEST	
03/19:18	CONT	00:18	00:33	02:41:17	03:10:43	F3F PULSE MODE TEST	
03/19:30	HI SAMP	00:12	12:00	02:53:17	02:58:43	F3F PULSE MODE TEST	
03/19:48	CONT	00:18	00:33	02:53:50	02:58:10	F3F PULSE MODE TEST	
03/20:00	HI SAMP	00:12	12:00	03:05:50	02:46:10	F3F PULSE MODE TEST	
03/20:18	CONT	00:18	00:33	03:06:23	02:45:37	F3F PULSE MODE TEST	
03/20:30	HI SAMP	00:12	12:00	03:18:23	02:33:37	F3F PULSE MODE TEST	

*Data Priority based from 10 to 1 (OI Data is 10)
**11 sec of tape used every 5 min 11 sec for HI SAMPLE and 10 min 11 sec for LOW SAMPLE
***If inerting verification is not required, recorder stays at LO SAMPLE

TABLE 9-7 - DFI PCM RECORDER USAGE (CONTINUED)

APPROX MET (DD/HH:MM)	MODE	Δt (HH:MM)	Δt TAPE** USAGE (HH:MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
03/20:48	CONT	00:18	00:33	03:18:56	02:33:04	F3F PULSE MODE TEST	
03/21:00	HI SAMP	00:12	12:00	03:30:56	02:21:04	F3F PULSE MODE TEST	
04/01:43	CONT	04:43	09:54	03:40:50	02:11:10	FCS C/O	
04/01:49	LO SAMP	00:06	06:00	03:46:50	02:05:10	NOMINAL CONFIG	
04/05:50	HI SAMP	04:01	04:13	03:51:03	02:00:57	LAST 10 HRS OF -XSI	
04:19:13	CONT	13:23	28:14	04:19:17	01:32:43	RCS TEST, 1 FWD ENG	
04:19:25	HI SAMP	00:12	12:00	04:31:17	01:20:43	RCS TEST, 1 FWD ENG	
05:00:12	LO SAMP	04:47	10:05	04:41:22	01:10:38	NOMINAL CONFIG	
05:22:44	CONT	22:32	24:12	05:05:34	00:46:26	RCS TEST, 2 FWD/1 AFT ENG	
05:22:56	HI SAMP	00:12	12:00	05:17:34	00:34:26	RCS TEST, 2 FWD/1 AFT ENG	
06/04:26	LO SAMP	05:30	11:33	05:29:07	00:22:53	NOMINAL CONFIG	
06/18:31	HI SAMP	14:05	15:02	05:44:09	00:07:51	RADIATOR BYPASS/STOW RADIATORS	
06/19:20	HI SAMP	00:49			01:36:00	DFI PCM RCDR REWIND	
06/19:48	CONT		00:28			PLBD CLOSING/STRAIN GAUGE	
06/19:52	HI SAMP		00:04				
06/19:57	CONT					RADIATOR HEAT SINK	
06/20:02	HI SAMP		00:05				
06/22:36	CONT					TIG-4 MINUTES THRU POST LANDING	
~07/00:00	HI SAMP		01:24			POST ROLLOUT	

*Data Priority based from 10 to 1 (OI Data is 10)
**11 sec of tape used every 5 min 11 sec for HI SAMPLE and 10 min 11 sec for LOW SAMPLE
***If inerting verification is not required, recorder stays at LO SAMPLE

TABLE 9-8 - ATTITUDE AND EVENT TIMELINE

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
0/00:08:34	MECO					3.5	0.3	0.2	*	AUTO	*					
0/00:08:49	ET SEP (4 fps, -Z)					3.5	0.3	0.2	*	AUTO	*					
0/00:09:30	INITIATE MANUAL MNVR TO OMS-1 BURN ATT	--	--	--	--	N/A	N/A	N/A	*	MAN ACCEL	*	--	--	--	--	
0/00:10:00	OMS-1 BURN ATT	337.2	190.5	346.5	INRTL	3.5	0.3	0.2	*	AUTO	*	69	359	99	181	
0/00:10:31.3	OMS-1 IGNITION					3.5	0.3	0.2	*	AUTO	*					162.1 fps ΔV
0/00:12:07.3	OMS-1 CUTOFF					3.5	0.3	0.2	*	AUTO	*					
0/00:13:21	MPS DUMP TERMINATED					3.5	0.3	0.2	*	AUTO	*					
0/00:20:00	INITIATE AUTO MNVR TO OMS-2 BURN ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 115
0/00:30:00	OMS-2 BURN ATT	19.1	312.6	342	INRTL	3.5	0.3	0.2	*	AUTO	*	36	16	146	356	
0/00:37:39.3	OMS-2 IGNITION					3.5	0.3	0.2	*	AUTO	*					174.8 fps ΔV
0/00:39:26.5	OMS-2 CUTOFF					3.5	0.3	0.2	*	AUTO	*					
0/00:55:00	DPS RECONFIG TO GNC 2 (OMS-2 ATT)					10.0	0.2	0.2	A	AUTO	NORM					
0/01:05:00	INITIATE -ZLV, XPOP +Yby FWD ATT MODE	--	--	--	--	10.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 103
0/01:14:00	-ZLV, XPOP ATT (PLBD OPENING) (12° ROLL BIAS)	0	192	90	LVLH	10.0	0.2	0.2	A	AUTO	NORM	90	348	89	54	P 90 Y 348 TGT: EARTH OM 270
0/03:41:00	FREE DRIFT					N/A	N/A	N/A	A	MAN PULSE	VERN					
0/04:10:00	INITIATE AUTO MNVR TO OMS-3 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 130

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
0/04:21:00	OMS-3 BURN ATT	331.6	153.4	359.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	40	0	60	181	
0/04:29:11.6	OMS-3 IGNITION					3.5	0.3	0.2	A	AUTO	NORM					62.3 fps ΔV
0/04:29:48.3	OMS-3 CUTOFF					1.0	0.02	0.2	A	AUTO	VERN					
0/04:55:00	INITIATE AUTO MNVR TO OMS-4 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 180
0/05:10:00	OMS-4 BURN ATT	28.4	333.8	1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	56	0	119	359	
0/05:14:12.5	OMS-4 IGNITION					3.5	0.3	0.2	A	AUTO	NORM					61.6 fps ΔV
0/05:14:48.6	OMS-4 CUTOFF					1.0	0.02	0.2	A	AUTO	VERN					
0/05:47:00	INITIATE GRAVITY GRADIENT ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 14 MIN EIG ANG = 159
0/06:01:00	GRAVITY GRADIENT ATT (PLB TO NORTH)	249.2	268.2	358.1	LVLH	N/A	N/A	N/A	A	MAN PULSE	VERN	3	157	141	109	P 357.6 Y 1 TGT: EARTH OM 249.2
0/07:47:00	TERMINATE GRAVITY GRADIENT	92.7	298	345.6	INRTL	1.0	0.02	0.2	A	MAN DISC	VERN	3	157	158	294	
0/07:56:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 13 MIN EIG ANG = 147
0/08:09:00	IMU ALIGN ATT	250	336.3	338.8	INRTL	1.0	0.02	0.2	A	AUTO	VERN	58	154	125	124	-Y ST TO STAR #43 -Z ST TO STAR #15 ANG SEP = 84.1
0/08:17:00	INITIATE AUTO MNVR TO COAS CAL ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 11
0/08:18:00	COAS CAL ATT	253.2	343.7	330.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	90	140	120	118	+Xby TO STAR #26
0/08:24:00	+X COAS CAL					N/A	N/A	N/A	B	MAN PULSE	VERN					
0/08:29:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
0/08:35:00	INITIATE -ZLV, XPOP +Yby FWD ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 99
0/08:44:00	-ZLV, XPOP ATT (12° ROLL BIAS)	0	192	90	LVLH	1.0	0.02	0.2	A	AUTO	VERN	90	348	90	55	P 90 Y 348 TGT: EARTH OM 270
0/18:32:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 13 MIN EIG ANG = 146
0/18:45:00	IMU ALIGN ATT	16.2	172.5	13.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	131	114	72	143	-Y ST TO STAR #15 -Z ST TO STAR #43 ANG SEP = 84.1
0/18:57:00	INITIATE GRAVITY GRADIENT ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 86
0/19:05:00	GRAVITY GRADIENT ATT (PLB TO NORTH)	249.2	268.2	358.1	LVLH	N/A	N/A	N/A	A	MAN PULSE	VERN	3	157	16	115	P 357.6 Y 1 TGT: EARTH OM 249.2
1/06:43:00	TERMINATE GRAVITY GRADIENT	92.3	358.6	19.1	INRTL	1.0	0.02	0.2	A	MAN DISC	VERN	3	157	90	293	
1/06:52:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 170
1/07:07:00	IMU ALIGN/STRK OPS DURING H2O DUMP ATT (FTO 473-01)	212.5	77.9	44.4	INRTL	1.0	0.02	0.2	A	AUTO	VERN	30	102	27	101	-Y ST TO STAR #27 -Z ST TO STAR #54 ANG SEP = 83.7
1/07:49:00	INITIATE AUTO MNVR TO PTC ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 100
1/07:58:00	PTC ATT	132.8	236	60.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	88	201	90	355	SUN IN YZby PLANE +X TOWARD R
1/08:07:00	START 0.4 °/SEC PTC ROTATION	132.8	236	60.1	ROTR	1.0	0.02	0.4	A	AUTO	VERN	89	236	90	355	EIGEN AXIS P 359 Y 0 ROT RATE = 0.4 °/SEC
1/19:12:00	INITIATE AUTO MNVR TO NAV BASE STA ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 12 MIN EIG ANG = 134
1/19:24:00	NAV BASE STA ATT #1 (FTO 474-01)	221.4	128.1	3.5	INRTL	1.0	0.02	0.2	A	AUTO	VERN	18	119	35	282	-Y ST TO STAR #40 -Z ST TO STAR #57 ANG SEP = 90.4
1/19:35:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT #2	--	--	--	--	1.0	0.02	0.5	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 180
1/19:41:00	IMU ALIGN/NAV BASE STA ATT #2	50.5	326.1	357.9	INRTL	1.0	0.02	0.5	A	AUTO	VERN	111	160	129	338	-Y ST TO STAR #57 -Z ST TO STAR #40 ANG SEP = 90.4

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	DEADBANDS RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	DAP CONT	DAP RCS	EARTH θ	EARTH Φ	SUN θ	SUN Φ	REMARKS
1/19:53:00	INITIATE AUTO MNVR TO -ZSI ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 95
1/20:01:00	-ZSI ATT	129.6	234.2	59.2	INRTL	1.0	0.02	0.2	A	AUTO	VERN	87	199	90	0	P 90 Y 0 TGT: SUN OM 90
1/20:20:00	IECM CONTAMINATION SURVEY (FTO 453-01)					3.0	0.02	0.3	B	AUTO & MAN	VERN					
1/22:55:00	RE-ESTABLISH -ZSI ATT					1.0	0.02	0.2	A	AUTO	VERN					
1/23:18:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 116
1/23:28:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	121	187	179	171	
2/01:10:00	IECM PLUME SURVEY (FTO 454-01)					3.0	0.02	0.2	A	AUTO & MAN	NORM & VERN					
2/03:10:00	RE-ESTABLISH -XSI ATT					0.1	0.02	0.2	B	AUTO	VERN					
2/03:56:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
2/04:04:00	IMU ALIGN ATT	256.2	13.7	345.8	INRTL	1.0	0.02	0.2	A	AUTO	VERN	57	153	91	128	-Y ST TO STAR #22 -Z ST TO STAR #51 ANG SEP = 84
2/04:22:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
2/04:30:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	118	12	180	0	
2/05:25:00	INITIATE AUTO MNVR TO RCS BURN 1 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
2/05:40:00	RCS BURN 1 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
2/05:45:00	RCS BURN 1					3.0	0.2	0.5	B	MAN DISC	NORM					
2/05:46:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
2/05:47:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
2/06:02:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	113	12	180	0	
2/19:02:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 114
2/19:12:00	IMU ALIGN ATT	61	240.3	318.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	165	200	143	137	-Y ST TO STAR #25 -Z ST TO STAR #14 ANG SEP = 91.4
2/19:27:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 114
2/19:37:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	113	14	180	0	
3/01:12:00	INITIATE AUTO MNVR TO RCS BURN 2 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
3/01:27:00	RCS BURN 2 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
3/01:32:00	RCS BURN 2					3.0	0.2	0.5	B	MAN DISC	NORM					
3/01:33:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					
3/01:37:00	INITIATE AUTO MNVR TO POST BURN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
3/01:52:00	POST RCS BURN 2 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
3/02:07:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
3/02:22:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	57	196	180	0	
3/04:05:00	INITIATE AUTO MNVR TO IMU ALIGN/BACKUP NAV ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 74
3/04:12:00	IMU ALIGN/BACKUP NAV ATT #1 (FTO 476-01)	252.9	252.5	348.9	INRTL	1.0	0.02	0.2	A	AUTO	VERN	144	158	146	245	-Y ST TO STAR #41 -Z ST TO STAR #34 ANG SEP = 88.6

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
3/04:26:00	INITIATE AUTO MNVR TO BACKUP NAV ATT #2	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 38
3/04:30:00	BACKUP NAV ATT #2	246.8	288.6	351	INRTL	1.0	0.02	0.2	A	AUTO	VERN	169	311	163	173	-Y ST TO STAR #20 -Z ST TO STAR #17 ANG SEP = 85
3/04:39:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 55
3/04:44:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	98	13	179	353	
3/17:37:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
3/17:42:00	IMU ALIGN ATT	241.7	307.6	353.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	82	148	149	153	-Y ST TO STAR #42 -Z ST TO STAR #15 ANG SEP = 89.1
3/18:02:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
3/18:07:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	145	26	179	352	
3/18:45:00	PRE FRCS THERMAL SOAKBACK CONFIG					5.0	0.2	0.2	A	AUTO	NORM					
3/18:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/18:50:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/19:20:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/19:20:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/19:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/19:50:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/20:20:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
3/20:20:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/20:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/20:53:00	POST FRCS THERMAL SOAKBACK CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
3/23:18:00	PRCS ATT HOLD TEST (FTO 477-01)					0.1	0.2	0.2	A	AUTO	NORM					
3/23:18:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/23:41:00	INITIATE AUTO MNVR TO TACAN TRK ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	P,Y JET OPT=3(TAIL CNTL) MNVR TIME = 14 MIN EIG ANG = 170
3/23:56:00	TACAN TRK ATT (FTO 479-01)	21.4	347.8	29.2	INRTL	5.0	0.2	0.2	A	AUTO	NORM	79	357	97	10	P 7.5 TGT: #3(KU) Y 0 LAT: -12.414 OM 180 LON: 130.883
3/23:56:30	INITIATE TACAN NAV ROT	21.4	347.8	29.2	ROTR	5.0	0.2	0.2	A	AUTO	NORM	81	357	97	10	EIGEN AXIS P 187.4 Y 276.8 ROT RATE = 0.323 °/SEC
4/00:12:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 178
4/00:27:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	76	12	179	352	
4/01:45:00	FCS CHECKOUT - APU START					5.0	0.2	0.2	A	AUTO	NORM					
4/01:53:00	APU SHUTDOWN					1.0	0.02	0.2	A	AUTO	VERN					
4/01:55:00	SENSOR TEST					N/A	N/A	N/A	A	MAN PULSE	VERN					
4/02:00:00	RE-ESTABLISH -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 30
4/02:03:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	55	7	179	352	
4/02:46:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
4/02:51:00	IMU ALIGN ATT	241.7	307.6	353.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	104	145	149	153	-Y ST TO STAR #42 -Z ST TO STAR #15 ANG SEP = 89.1
4/03:02:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
4/03:07:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	157	39	179	352	
4/04:15:00	INITIATE AUTO MNVR TO RCS BURN 3 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/04:30:00	RCS BURN 3 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/04:36:00	RCS BURN 3					3.0	0.2	0.5	B	MAN DISC	NORM					
4/04:37:00	ATTITUDE HOLD					1.0	[illegible]	0.2	A	AUTO	VERN					
4/04:47:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
4/05:02:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	63	9	179	352	
4/18:18:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 121
4/18:29:00	IMU ALIGN/NAV BASE STA ATT #1 (FTO 474-01)	165.6	157.2	4.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	31	131	57	350	-Y ST TO STAR #49 -Z ST TO STAR #32 ANG SEP = 87.8
4/18:35:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT Q2	--	--	--	--	1.0	0.02	0.5	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 180
4/18:41:00	IMU ALIGN/NAV BASE STA ATT #2 (FTO 474-01)	104.9	346.1	11.1	INRTL	1.0	0.02	0.5	A	AUTO	VERN	123	101	108	284	-Y ST TO STAR #32 -Z ST TO STAR #49 ANG SEP = 87.8
4/18:52:00	INITIATE AUTO MNVR TO FRCS THERMAL SOAKBACK ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 12 MIN EIG ANG = 144
4/19:04:00	FRCS THERMAL SOAKBACK ATT	317.6	227.7	54.5	INRTL	1.0	0.02	0.2	A	AUTO	VERN	81	42	90	180	+Z SI +X TOWARD A
4/19:13:00	FRCS THERMAL SOAKBACK CONFIG					5.0	0.2	0.2	A	AUTO	NORM					

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
4/19:15:00	-X TRANS (FTO 412-05)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
4/19:18:00	POST FRCS THERMAL SOAKBACK CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
4/19:24:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 10
4/19:25:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	101	124	90	179	P 270 Y 0 TGT: SUN OM 267
4/20:55:00	INITIATE AUTO MNVR TO RCS BURN 4 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/21:10:00	RCS BURN 4 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/21:15:00	RCS BURN 4					3.0	0.2	0.5	B	MAN DISC	NORM					
4/21:16:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					
4/21:20:00	INITIATE AUTO MNVR TO POST BURN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/21:35:00	POST RCS BURN 4 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/21:52:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
4/22:07:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	84	50	90	180	P 270 Y 0 TGT: SUN OM 267
4/22:34:00	INITIATE AUTO MNVR TO IECM GAS RELEASE ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 115
4/22:44:00	IECM GAS RELEASE ATT (FSO S431-01)	0	90	270	LVLH	1.0	0.02	0.2	A	AUTO	VERN	90	270	77	254	P 0 Y 270 TGT: EARTH OM 90
4/23:05:00	IECM GAS RELEASE ROTATION	345.4	206.5	61.7	ROTR	0.5	0.02	0.007	A	AUTO	VERN	90	270	77	170	EIGEN AXIS P 180 Y 0 ROT RATE = 0.007 °/SEC
4/23:50:00	STOP ROTATION/ATTITUDE HOLD	326.5	206.5	61.7	INRTL	1.0	0.02	0.2	A	AUTO	VERN	90	108	77	189	

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
4/23:53:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 2 MIN EIG ANG = 17
4/23:55:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	100	117	90	180	P 270 Y 0 TGT: SUN OM 267
5/01:18:00	PRE RMS/PRCS INTERACTION CONFIG (FTO 452-03)					N/A	N/A	N/A	B	MAN PULSE	NORM					
5/01:58:00	POST RMS/PRCS INTERACTION CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
5/04:24:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 64
5/04:30:00	IMU ALIGN ATT	12.4	208.6	4.9	INRTL	1.0	0.02	0.2	A	AUTO	VERN	144	104	104	142	-Y ST TO STAR #51 -Z ST TO STAR #22 ANG SEP = 84
5/04:48:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 64
5/04:54:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	97	227	90	180	P 270 Y 0 TGT: SUN OM 267
5/05:05:00	RCS HOT FIRE TEST					N/A	N/A	N/A	A	MAN PULSE	NORM					
5/05:20:00	RE-ESTABLISH +ZSI ATT					0.1	0.02	0.2	B	AUTO	VERN					
5/15:45:00	FRCS/ARCS THERMAL SOAKBACK DAP CONFIG					5.0	0.2	0.2	A	AUTO	NORM					P,Y JET OPT = 3 (TAIL CNTL)
5/17:57:00	INITIATE AUTO MNVR TO IMU ALIGN/BACKUP NAV ATT 1	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 86
5/18:05:00	IMU ALIGN/BACKUP NAV ATT 1	252.9	252.5	348.9	INRTL	3.0	0.2	0.2	A	AUTO	NORM	150	141	149	260	-Y ST TO STAR #41 -Z ST TO STAR #34 ANG SEP = 88.6
5/18:22:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 2	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 38
5/18:26:00	BACKUP NAV ATT 2	246.8	288.6	351	INRTL	3.0	0.2	0.2	A	AUTO	NORM	158	339	165	180	-Y ST TO STAR #20 -Z ST TO STAR #17
5/18:35:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
5/18:43:00	+ZSI ATT	321.2	224	51.4	INRTL	3.0	0.2	0.2	A	AUTO	NORM	84	281	90	180	P 270 Y 0 TGT: SUN OM 267
5/19:30:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 1	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 75
5/19:37:00	BACKUP NAV ATT 1	255	255.8	0.6	INRTL	3.0	0.2	0.2	A	AUTO	NORM	145	153	145	241	-Y ST TO STAR #41
5/19:52:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 2	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 36
5/19:55:00	BACKUP NAV ATT 2	246.8	288.6	351	INRTL	3.0	0.2	0.2	A	AUTO	NORM	164	347	165	180	-Y ST TO STAR #20 -Z ST TO STAR #17
5/20:07:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
5/20:15:00	+ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	NORM	83	286	90	180	P 270 Y 0 TGT: SUN OM 267
5/22:22:00	PRSD +PITCH MNVR (FTO 445-01)	321.2	224	51.4	ROTR	5.0	0.2	1.0	A	MAN DISC	NORM	87	72	90	180	EIGEN AXIS P 0 Y 90 ROT RATE = 1.0 °/SEC
5/22:25:00	PDRS -PITCH MNVR (FTO 445-01)	38.8	44	308.6	ROTR	5.0	0.2	1.0	A	MAN DISC	NORM	89	96	90	0	EIGEN AXIS P 0 Y 270 ROT RATE = 1.0 °/SEC
5/22:28:00	+ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	NORM	94	95	90	180	P 270 Y 0 TGT: SUN OM 267
5/22:32:00	INITIATE AUTO MNVR TO FRCS/ARCS THERMAL SOAKBACK ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 3
5/22:33:00	FRCS/ARCS THERMAL SOAKBACK ATT	319.3	226.9	53.2	INRTL	5.0	0.2	0.2	A	AUTO	NORM	97	114	90	180	
5/22:46:00	FRCS THERMAL SOAKBACK BURN (FTO 412-06)					5.0	0.2	0.2	A	AUTO	NORM					F2F/F3F 30 SEC BURN
5/22:47:00	ARCS THERMAL SOAKBACK BURN (FTO 412-08)					5.0	0.2	0.2	A	AUTO	NORM					L1A 100 SEC BURN
5/22:49:00	ATTITUDE HOLD					5.0	0.2	0.2	A	AUTO	NORM					
5/23:02:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 3

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TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	DEADBANDS RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	DAP CONT	DAP RCS	EARTH θ	EARTH Φ	SUN θ	SUN Φ	REMARKS
5/23:03:00	ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	VERN	98	236	90	180	P 270 Y 0 TGT: SUN OM 267
6/04:22:00	FRCS/ARCS THERMAL SOAKBACK RECONFIG					1.0	0.02	0.2	A	AUTO	VERN					
6/04:32:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 90
6/04:40:00	IMU ALIGN ATT	261	349.6	39	INRTL	1.0	0.02	0.2	A	AUTO	VERN	51	101	92	131	-Y ST TO STAR #43 -Z ST TO STAR #28 ANG SEP = 85
6/04:52:00	INITIATE AUTO MNVR TO PTC ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 76
6/04:59:00	PTC ATT	8.6	226.8	53	INRTL	1.0	0.02	0.2	A	AUTO	VERN	106	161	90	131	SUN IN YZby PLANE +X TOWARD A
6/05:05:00	START 0.4 DEG/SEC PTC ROTATION	8.6	226.8	53	ROTR	1.0	0.02	0.4	A	AUTO	VERN	101	185	90	131	EIGEN AXIS P 358 Y 0 ROT RATE = 0.4°/SEC
6/05:25:00	S-BAND/UHF ANTENNA PATTERNS (FTO 471-01)	133	221.3	54.1	ROTR	5.0	0.2	2.0	A	AUTO	NORM	79	143	87	11	EIGEN AXIS P 358 Y 0 ROT RATE = 2.0°/SEC
6/05:35:00	RE-ESTABLISH PTC	252	222.5	50.8	ROTR	1.0	0.02	0.4	A	AUTO	VERN	72	64	89	251	EIGEN AXIS P 358 Y 0 ROT RATE = 0.4°/SEC
6/16:02:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 105
6/16:11:00	IMU ALIGN ATT	248.2	248.9	339.4	INRTL	1.0	0.02	0.2	B	AUTO	VERN	28	141	148	281	-Y ST TO STAR #41 -Z ST TO STAR #50 ANG SEP = 85
6/16:22:00	INITIATE AUTO MNVR TO TAIL-TO-SUN	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 34
6/16:25:00	TAIL-TO-SUN ATT	258.6	284.1	341	INRTL	1.0	0.02	0.2	A	AUTO	VERN	54	144	176	178	SUN 3° BELOW -Xby
6/18:05:00	CONFIG TO PRCS					3.0	0.2	0.5	B	AUTO	NORM					
6/19:54:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 119
6/19:58:00	IMU ALIGN ATT	227	35.6	43.9	INRTL	3.0	0.2	0.5	B	AUTO	NORM	66	114	58	135	-Y ST TO STAR #14 -Z ST TO STAR #26 ANG SEP = 91.4

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TABLE 9-8 Concluded

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ) Roll	Pitch	Yaw	ATT MODE	DEADBANDS ATT (deg)	RATE (°/sec)	DISC RATE (°/sec)	DAP SEL	CONT	RCS	EARTH θ	Φ	SUN θ	Φ	REMARKS
6/20:05:00	INITIATE AUTO MNVR TO IMU ALIGN VERIFICATION ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 2 MIN EIG ANG = 48
6/20:07:00	IMU ALIGN VERIFICATION ATT	174.1	57.6	25.8	INRTL	3.0	0.2	0.5	B	AUTO	NORM	78	165	41	192	-Y ST TO STAR #49 -Z ST TO STAR #60 ANG SEP = 84.1
6/20:22:00	INITIATE AUTO MNVR TO TOP-TO-SUN ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 111
6/20:26:00	TOP-TO-SUN ATT	141.2	155.9	334.9	INRTL	3.0	0.2	0.5	B	AUTO	NORM	46	204	70	0	
6/21:09:00	CONFIG RJDs FOR ENTRY					3.0	0.2	0.5	B	AUTO	NORM					
6/21:11:00	DPS RECONFIG TO GNC 3					3.5	0.3	0.2	*	AUTO	*					
6/22:26:00	INITIATE AUTO MNVR TO DEORB BURN ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 51
6/22:31:00	DEORB BURN ATT	152	113	354	INRTL	3.5	0.3	0.2	*	AUTO	*	133	0	30	316	
6/22:40:00	ACTIVATE SINGLE APU					3.5	0.3	0.2	*	AUTO	*					
6/22:41:49	DEORB BURN IGNITION					3.5	0.3	0.2	*	AUTO	*					315.2 fps ΔV
6/22:44:44	DEORB BURN CUTOFF					3.5	0.3	0.2	*	AUTO	*					
6/22:46:00	INITIATE AUTO MNVR TO EI-5 ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 132
6/22:55:00	ACTIVATE REMAINING APUs					3.5	0.3	0.2	*	AUTO	*					
6/22:57:00	EI-5 ATT	196	339	26	INRTL	3.5	0.3	0.2	*	AUTO	*	103	179	107	201	
6/23:03:37	EI-5	1	39	359	LVLH	3.5	0.3	0.2	*	AUTO	*	129	180	107	201	

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ABBREVIATIONS/ACRONYMS

More complete compilations of abbreviations and acronyms are available in the Acronyms and Abbreviations Dictionary (Ref. 4).

ABBREVIATIONS/ACRONYMS

ACIP	AERODYNAMIC COEFFICIENTS IDENTIFICATION PACKAGE
ACN	ASCENSION ISLAND (STDN SITE)
ACT	ACTIVATE
ADI	ATTITUDE DIRECTION INDICATOR
AGO	SANTIAGO, CHILE (STDN SITE)
ANT	ANTENNA
AOA	ABORT ONCE AROUND
AOS	ACQUISITION OF SIGNAL
ATT	ATTITUDE
ATO	ABORT TO ORBIT
BDA	BERMUDA ISLAND, BWI (STDN SITE)
BOT	BOTSWANA (STDN SITE)
BUC	BUCKHORN, CALIFORNIA (STDN SITE)
CAL	CALIBRATION
CCTV	CLOSED CIRCUIT TV
CCU	CREWMAN COMMUNICATIONS UMBILICAL
CDR	COMMANDER
CDT	CENTRAL DAYLIGHT TIME
CFES	CONTINUOUS FLOW ELECTROPHORESIS SYSTEM
CHG	CHANGE
CL	CHECKLIST
COAS	CREWMAN OPTICAL ALIGNMENT SIGHT
C&W	CAUTION AND WARNING
DAP	DIGITAL AUTO PILOT
DB	DEADBAND
DEU	DISPLAY ELECTRONICS UNIT
DFI	DEVELOPMENT FLIGHT INSTRUMENTATION

DKR	DAKAR, SENEGAL (STDN SITE)
DTO	DETAILED TEST OBJECTIVE
ECLS	ENVIRONMENTAL CONTROL LIFE SUPPORT SYSTEM
EDW	EDWARDS AFB, CALIFORNIA (DEORB OPT SITE)
EES	EMERGENCY EJECTION SUITS
EET	EVENT ELAPSED TIME
EMU	EXTRAVEHICULAR MOBILITY UNIT
EVA	EXTRAVEHICULAR ACTIVITY
FC	FUEL CELL
FDF	FLIGHT DATA FILE
FM	FREQUENCY MODULATION
FRD	FLIGHT REQUIREMENTS DOCUMENT
FSO	FUNCTIONAL SUPPLEMENTARY OBJECTIVE
FTO	FUNCTIONAL TEST OBJECTIVE
FWD	FORWARD
GAS	GET-AWAY SPECIAL
GDS	GOLDSTONE, CALIFORNIA (STDN SITE, 1ST ANTENNA)
GDX	GOLDSTONE, CALIFORNIA (STDN SITE, 2ND ANTENNA)
GNC	GUIDANCE NAVIGATION AND CONTROL
GPC	GENERAL PURPOSE COMPUTER
GSTDN	GROUND SPACE TRACKING & DATA NETWORK
GTS	GUAM ISLAND, U.S. (SGLS SITE)
GWM	GUAM ISLAND, U.S. (STDN SITE)
HAW	HAWAII (KAUAI, STDN SITE)
HTS	HAWAII (SGLS SITE)
HYD	HYDRAULIC
IECM	INDUCED ENVIRONMENTAL CONTAMINATION MONITOR

IMU	INERTIAL MEASUREMENT UNIT
INRTL	INERTIAL
IOS	INDIAN OCEAN (SGLS SITE)
ITS	INTERIM TELEPRINTER SYSTEM
LOS	LOSS-OF-SIGNAL; LINE-OF-SIGHT
LVLH	LOCAL VERTICAL LOCAL HORIZONTAL
MAD	MADRID, SPAIN (STDN SITE, 1ST ANTENNA)
MAX	MADRID, SPAIN (STDN SITE, 2ND ANTENNA)
MCC	MISSION CONTROL CENTER
MDM	MULTIPLEXER/DEMULTIPLEXER
MECO	MAIN ENGINE CUTOFF
MET	MISSION ELAPSED TIME
MIL	MERRITT ISLAND, FLORIDA (STDN SITE)
MILA	MERRITT ISLAND LAUNCH AREA
MLR	MONODISPERSE LATEX REACTOR
MLX	MERRITT ISLAND, FLORIDA (STDN SITE, 2ND ANTENNA)
MNVR	MANEUVER
MPM	MANIPULATOR POSITION MECHANISM
MPS	MAIN PROPULSION SYSTEM
MRL	MANIPULATOR RETENTION LATCHES
MTVC	MANUAL THRUST VECTOR CONTROL
NHS	NEW HAMPSHIRE (SGLS SITE)
OBS	OPERATIONAL BIOMED SENSORS; OBSERVATIONS
OEX	ORBITER EXPERIMENTS
OI	OPERATIONAL INSTRUMENTATION
OMS	ORBITAL MANEUVERING SYSTEM
OPS	OPERATIONS; OPERATIONAL SEQUENCE

ORB	ORBITER
ORR	ORRORAL VALLEY, AUSTRALIA (STDN SITE)
PCM	PULSE-CODE MODULATION
PDRS	PAYLOAD DEPLOYMENT AND RETRIEVAL SYSTEM
PL	PAYLOAD
PLBD	PAYLOAD BAY DOORS
PLT	PILOT
PM	PHASE MODULATION
PMC	PRIVATE MEDICAL COMMUNICATION
PMP	PUMP
PRCS	PRIMARY RCS
PRO	PROCEED
PSA	PRE/POST SLEEP ACTIVITY
PTC	PASSIVE THERMAL CONTROL
RCS	REACTION CONTROL SYSTEM
REF	REFERENCE
REFSMMAT	REFERENCE STABLE MEMBER MATRIX
RELMAT	RELATIVE MATRIX
RF	RADIO FREQUENCY
RMS	REMOTE MANIPULATOR SYSTEM
ROT	ROTATION
RTC	REAL TIME COMMAND
SAA	SOUTH ATLANTIC ANOMALY
S-BD	S-BAND
SEL	SELECT
SGLS	SPACE GROUND LINK SYSTEM/STATION (DOD)
SPC	STORED PROGRAM COMMAND
SSO	SUPPORT SYSTEM FOR THE OEX

ST	STAR TRACKER
STDN	SPACE TRACKING & DATA NETWORK
STS	SPACE TRANSPORTATION SYSTEM
TB	TALKBACK
TDRS	TRACKING AND DATA RELAY SATELLITE
TIG	TIME OF IGNITION
UHF	ULTRA HIGH FREQUENCY
VAC	VACUUM
VTR	VIDEO TAPE RECORDER
VTS	VANDENBERG TRACKING STATION (SGLS SITE)
WCCU	WIRELESS CREW COMMUNICATIONS UNIT
WCS	WASTE COLLECTION SYSTEM
WMC	WASTE MANAGEMENT COMPARTMENT
XFER	TRANSFER
X-POP	X BODY AXIS PERPENDICULAR TO ORBIT PLANE
-XSI	-X BODY AXIS TOWARDS SUN (TAIL TO SUN)
YAR	YARRAGADEE, AUSTRALIA (STDN SITE)
Y-POP	Y BODY AXIS PERPENDICULAR TO ORBIT PLANE
-ZLV	-Z LOCAL VERTICAL (-Z BODY AXIS TOWARDS EARTH)
+ZSI	+Z BODY AXIS TOWARDS SUN (BOTTOM TO SUN)

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